MyNAS® Storage Appliance Administration Guide

Release 1.3 (Yarra)

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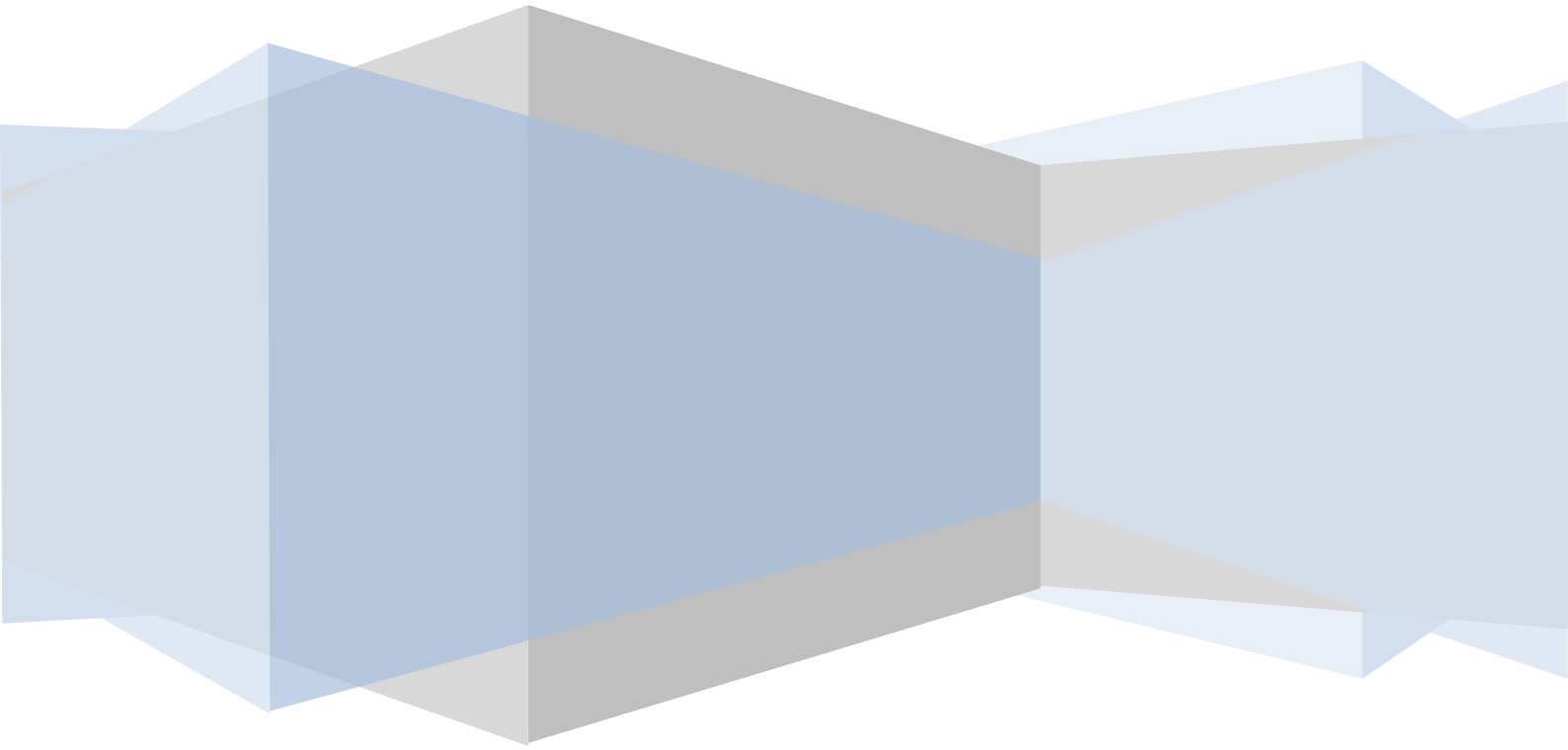

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Preface

Welcome to the MyNAS® Storage Appliance Installation Guide. This guide will help you getting "up and running" with MyNAS on your hardware, and assisting with initial configuration of MyNAS Release 1.3 (Yarra).

Why use MyNAS?

Ask yourself this question: Where do I store all my important digital assets today – assets such as photos, videos, taxation documents, school projects or assignments, work documents, email?

In today's society, it is fairly rare to not have some form of a digital footprint – from taking photos to Facebook, email, typing up that essay for class or a project such as tracing family history – we all create some form of digital data that is saved on our computer.

It was not that long ago that content such as student assignments or documents we created were stored on the good old floppy disks – and saved many times to different disks as a backup. We did this as it was common for our main disk to fail – right when we need it the most (Murphy's Law). Technology has significantly improved since then, and our reliance on multiple backups such as to disks has reduced – however computers are not immune to failure – malware, virus' all plague us today in one shape or another.

So back to the question – where do you store all your important digital data? On your laptop, on your desktop, on your portable drive? What happens is any one of those fail? Will you lose all your data – potentially. What happens if it gets lost, damaged (fire, water), stolen?

MyNAS integrates the ZFS filesystem into an easy to use platform for the storage of your important digital content. The benefits of ZFS include protection against data corruption, support for high storage capacities, integration of the concepts of filesystem and volume management, snapshots and copy-on-write clones, continuous integrity checking and automatic repair - off of which are highly important in today's digital age to safeguard and protect your data.

MyNAS provides you a solution to store all your important data in a robust manner utilising enterprise technology – providing a secure, robust and scalable platform for you to safeguard your digital data. By employing cloud services for the most important data, you can be rest assured that your important digital data is safe.

Understanding ZFS Pools

A ZFS pool, once created as a specific type or member size, cannot be changed without destroying that ZFS pool. It can however, be added to. For example:

- Today in my system I have 5 available drives for a ZFS pool. I create a ZFS raidz using all five drives and I call this pool name "green":

```
enable# show zpool list
NAME    SIZE  ALLOC   FREE    CAP  DEDUP  HEALTH  ALTROOT
green   199G   984M   198G     0%  6.12x  ONLINE  -

enable# show zpool status
  pool: green
 state: ONLINE
  scan: none requested
config:

        NAME          STATE     READ WRITE CKSUM
        green         ONLINE       0     0     0
          raidz1-0    ONLINE       0     0     0
            disk_sdc  ONLINE       0     0     0
            disk_sdd  ONLINE       0     0     0
            disk_sde  ONLINE       0     0     0
            disk_sdf  ONLINE       0     0     0
            disk_sdg  ONLINE       0     0     0

errors: No known data errors
```

- Tomorrow I add another 5 drives to my system. I can add this to the original ZFS pool expanding its overall size:

```
enable# show zpool list
NAME    SIZE  ALLOC   FREE    CAP  DEDUP  HEALTH  ALTROOT
green   398G   984M   397G     0%  6.12x  ONLINE  -

enable# show zpool status
  pool: green
 state: ONLINE
  scan: none requested
config:

        NAME          STATE     READ WRITE CKSUM
        green         ONLINE       0     0     0
          raidz1-0    ONLINE       0     0     0
            disk_sdc  ONLINE       0     0     0
            disk_sdd  ONLINE       0     0     0
            disk_sde  ONLINE       0     0     0
            disk_sdf  ONLINE       0     0     0
            disk_sdg  ONLINE       0     0     0
          raidz1-1    ONLINE       0     0     0
            disk_sdh  ONLINE       0     0     0
            disk_sdi  ONLINE       0     0     0
            disk_sdj  ONLINE       0     0     0
            disk_sdk  ONLINE       0     0     0
            disk_sdl  ONLINE       0     0     0

errors: No known data errors
enable#
```

- I just as easily could have created a new ZFS pool with the new drives, or added them in a different configuration as my requirements dictate.

What I am unable to do however is add the new 5 disks to the original raidz1-0 configuration. If I wanted to do that, I would have to destroy the original configuration to re-create the configuration with all 10 disks.

For further details and information surrounding ZFS and its best practices, refer to the following online resource:

http://www.solarisinternals.com/wiki/index.php/ZFS_Best_Practices_Guide

ZFS Pools with MyNAS® Storage Appliance

In order to use MyNAS Storage Appliance, a ZFS pool needs to be created utilising the disks assigned through the Configuration Wizard.

Understanding ZFS Pool Types

ZFS provides a number to options as to how to store your data. These options are highlighted below. It is important to understand what each ZFS pool type is, and what protection it provides in order to select the right ZFS pool type for your data.

ZFS 2-Way Mirror

A ZFS 2-Way mirror is akin to a traditional RAID1 solution where the disks mirror the data, so that each drive has an exact copy of all data.

The resiliency of this solution is that if one drive fails, the data is still available.

If a drive in the mirror does fail, mirrors are also quicker (than raidz) to return to a healthy state when the drive is replaced (resilver).

ZFS 3-Way Mirror

Similar to a ZFS 2-Way mirror, however the data is now mirrored amongst 3 drives.

The resiliency of this solution is that 2 drives can fail and the data will still be available.

If a drive in the mirror does fail, mirrors are also quicker (than raidz) to return to a healthy state when the drive is replaced (resilver).

ZFS Raidz 1

A ZFS Raidz-1 Pool is akin to a traditional RAID5 solution, except that there is no RAID5 write-hole[1] when using ZFS.

The resiliency of this solution is that a single drive can fail and the data will still be available.

If a drive in the pool does fail, it will take time to recalculate and resilver the lost data. During that time, should another drive fail, the data in that ZFS pool could be lost.

ZFS Raidz 2

A ZFS Raidz-2 Pool is akin to a traditional RAID6 solution, except that there is no RAID6 write-hole when using ZFS.

The resiliency of this solution is that two drives can fail and the data will still be available.

If a drive in the pool does fail, it will take time to recalculate and resilver the lost data. During that time, should another drive fail, the data in that pool will not be lost (like Raidz-1) and still recoverable.

ZFS Raidz 3

A ZFS Raidz-2 Pool is akin to a traditional RAID6 solution, except that there is no RAID6 write-hole when using ZFS.

The resiliency of this solution is that three drives can fail and the data will still be available.

If a drive in the pool does fail, it will take time to recalculate and resilver the lost data. During that time, should another drive fail, the data in that pool will not be lost (like Raidz-1) and still recoverable.

[1] For further details on RAID5 write-holes refer to http://www.raid-recovery-guide.com/raid5-write-hole.aspx

ZFS Pool Type Capacity and Utilisation

The table below details when each ZFS Pool Type option is enabled within MyNAS and the initial ZFS storage space that would be available when selecting a specific ZFS pool type:

ZFS Pool Type	Capacity	Utilisation	Minimum number of disks allocated for ZFS using MyNAS
ZFS 2-Way Mirror	Smallest Drive Size	((Capacity / capacity of all drives) / 100)%	2
ZFS 3-Way Mirror	Smallest Drive Size	((Capacity / capacity of all drives) / 100)%	3
ZFS Raidz 1	Smallest Drive Size * (number of drives -1)	((Capacity / capacity of all drives) / 100)%	4
ZFS Raidz 2	Smallest Drive Size * (number of drives -2)	((Capacity / capacity of all drives) / 100)%	6
ZFS Raidz 3	Smallest Drive Size * (number of drives -3)	((Capacity / capacity of all drives) / 100)%	7

ZFS Pool Type Capacity and Utilisation Example

The example below details using the above ZFS pool type and the resulting storage space each ZFS pool provides

ZFS Pool Type	Disk Capacity	Minimum number of disks allocated for ZFS using MyNAS	Approximate Available Capacity
ZFS 2-Way Mirror	1TB Disks	2	~1TB
ZFS 3-Way Mirror	1TB Disks	3	~1TB
ZFS Raidz 1	1TB Disks	4	~3TB
ZFS Raidz 2	1TB Disks	6	~4TB
ZFS Raidz 3	1TB Disks	7	~4TB

Understanding ZFS Pool Enhanced Configuration Options

In addition to the ZFS Pool Types, additional enhanced configurations can be created by using MyNAS. These are:

- Adding a ZFS Intent Log (ZIL)
- Adding a ZFS Cache (L2ARC)
- Adding Spare Disks

Understanding ZFS Intent Log (ZIL)

The objective behind the ZFS Intent Log is to provide insurance of writing data to your disks in the event of a power failure - keeping track of what needs to be written to disk even if the power fails. The caveat around this is that the ZIL will only be used by applications that utilise synchronous writes.

For 99.9% of MyNAS Storage Appliance installations, using a ZIL will not provide any benefit. The best ZIL you can have for MyNAS is to deploy an Uninterruptible Power Supply (UPS) to provide that power backup in the event of a power loss situation.

Understanding ZFS Cache (L2ARC)

L2ARC stands for Level 2 Adaptive Replacement Cache, and is utilised as a read cache for the ZFS Pool. Generally, before deploying an L2ARC device, it is best advised to populate your system with as much memory as possible before considering an L2ARC device. With this being said, until you reach 64GB of memory in your system you do not need to consider a dedicated L2ARC device.

Understanding ZFS Spare Disks

ZFS Spare disks provide an immediate online replacement when a disk failure is detected. Consider the following scenario:

```
  pool: storage
 state: DEGRADED
status: One or more devices are faulted in response to persistent errors.
        Sufficient replicas exist for the pool to continue functioning in a
        degraded state.
action: Replace the faulted device, or use 'zpool clear' to mark the device
        repaired.
  scan: scrub repaired 0 in 7h55m with 0 errors on Sun Jun 22 09:55:58 2014
config:

        NAME          STATE     READ WRITE CKSUM
        storage       DEGRADED     0     0     0
          raidz1-0    DEGRADED     0     0     0
            disk_sda  FAULTED      0   162     0  too many errors
            disk_sdc  ONLINE       0     0     0
            disk_sdb  ONLINE       0     0     0
            disk_sdd  ONLINE       0     0     0

errors: No known data errors
```

In this situation, without a spare disk, the ZFS pool remains in a DEGRADED state until the FAULTED disk is removed and replaced. This puts the entire ZFS pool at risk, as if a further disk is lost (FAULTED) before the existing FAULTED disk is replaced, the whole ZFS pool will be lost.

If this event (a faulted disk) occurs when there is no human visibility (night time, weekends, holidays) manual intervention is required to replace the FAULTED disk. By having a spare disk available, this becomes an automatic process when the actual event occurs.

In a typical scenario for each type of ZFS Pool Type, you would have the same number of spares as per the table below:

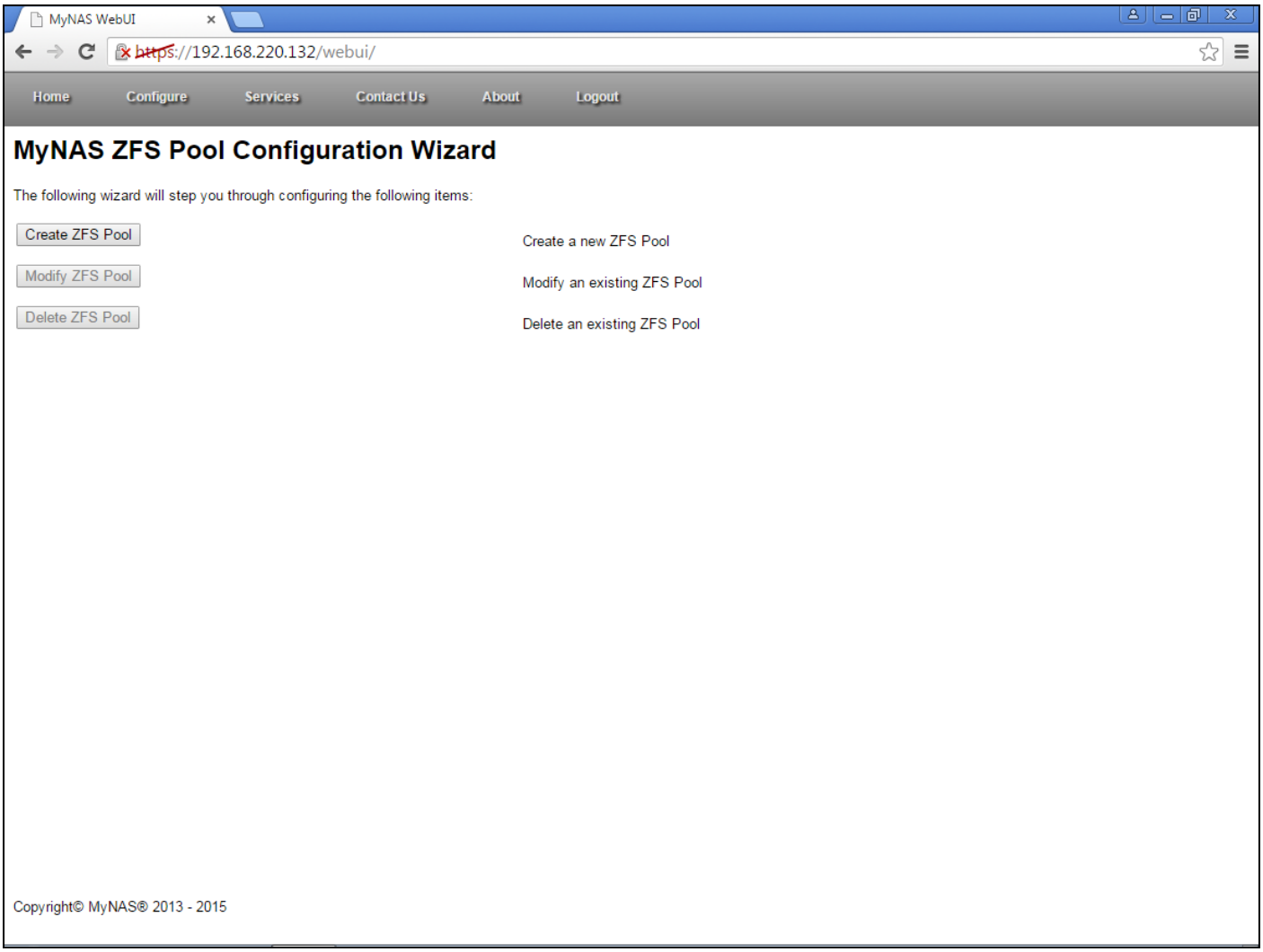
ZFS Pool Type	Suggested number of configured online spares
ZFS 2-Way Mirror	1
ZFS 3-Way Mirror	1
ZFS Raidz 1	1
ZFS Raidz 2	2
ZFS Raidz 3	3

Spare disks also need to be sized correctly. If all your disks in your ZFS pool are 1TB disks, then the spare disks should be same or larger in capacity.

Creating a ZFS Pool on MyNAS Storage Appliance

From the WebUI login page, login as the enable user. Click on the 'Configure' menu bar item, and select 'Configure ZFS Storage' to bring up the ZFS Storage Creation wizard.

When there are no existing ZFS pools, the 'Create ZFS Pool' is the only available option. Once a ZFS pool has been defined, the Modify and Delete buttons are enabled.

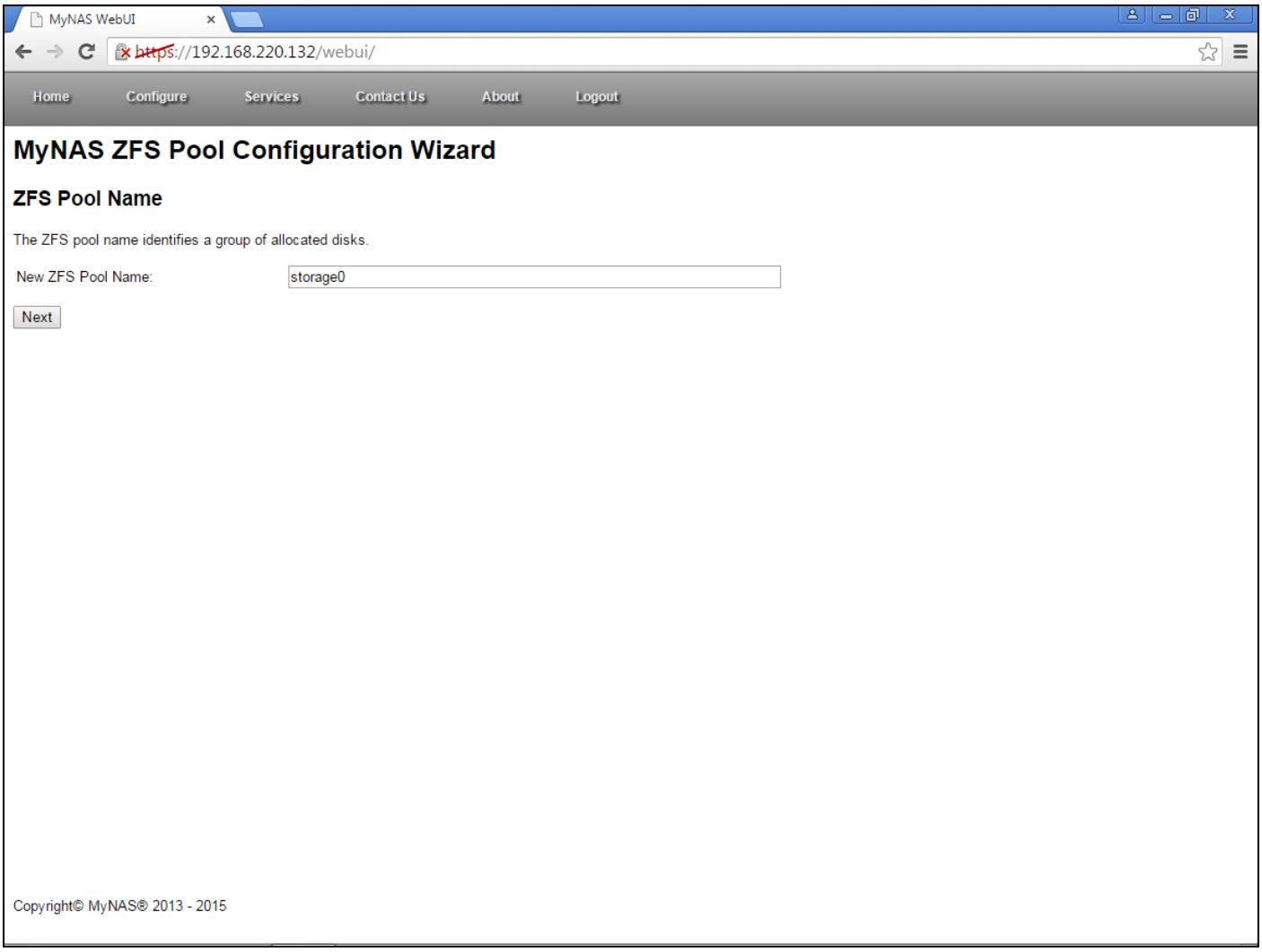


To create a ZFS Pool, click the 'Create ZFS Pool' button.

The ZFS pool requires a name, with the following restrictions:

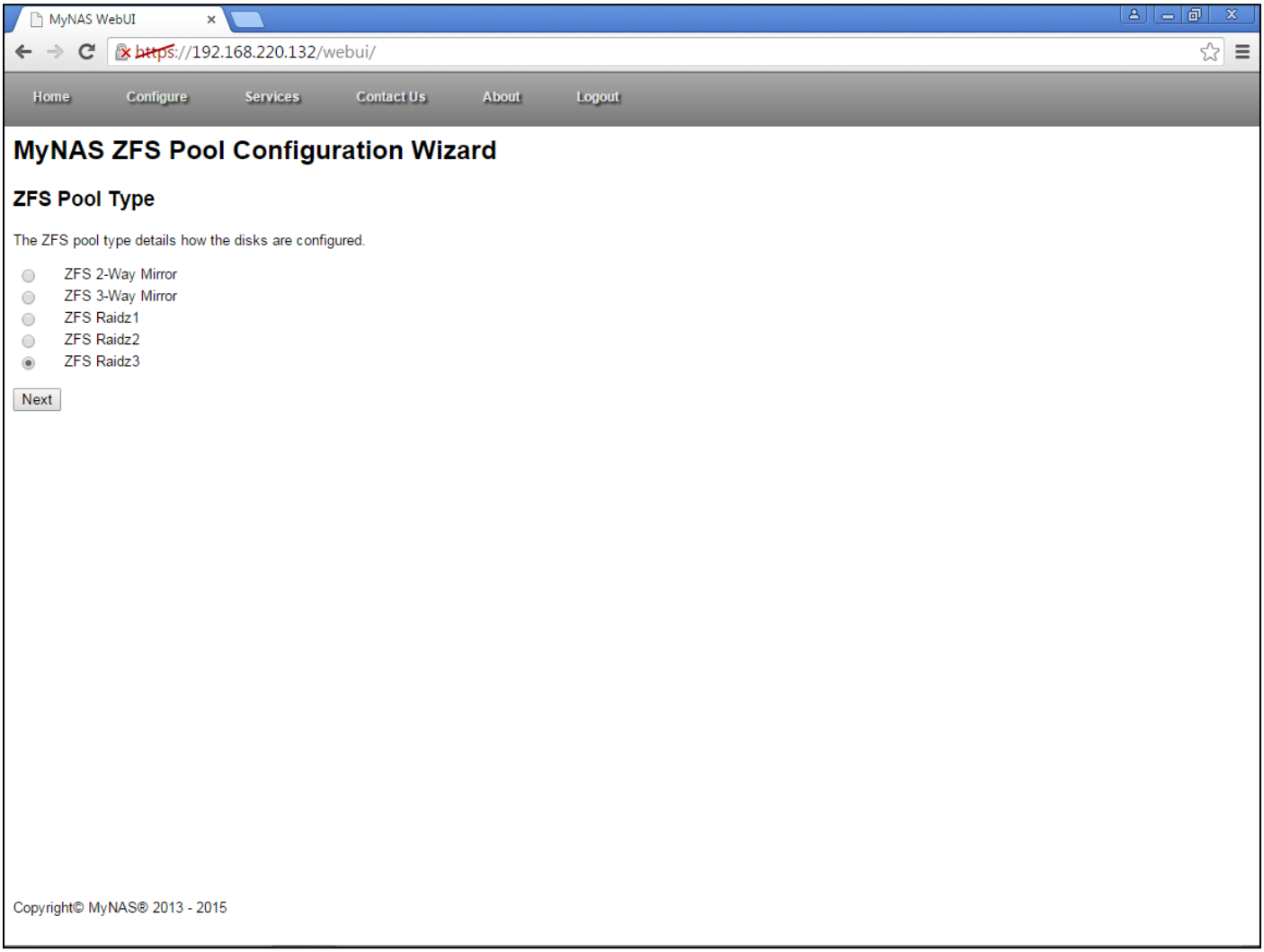
- Only alpha numeric characters
- Special characters cannot be used
- Characters such as '-' (dash) and '_' (underscore) are invalid characters
- ZFS reserved names cannot be used (mirror, raidz, raidz2, raidz3)

MyNAS provides an initial suggestion. Once a ZFS Pool name has been entered, click 'Next'.



Select the type of ZFS Pool to be created. The available ZFS Pool types are activated dependant on the number of disks selected for use for ZFS during the Initial Setup Wizard.

Note: To change a ZFS pool type once the pool is created, the pool must be destroyed, which also destroys all data on that ZFS pool.



Select the appropriate ZFS Pool Type for this ZFS Pool.[2] Once selected, click 'Next' to continue.

[2] For advice on ZFS Pools, refer to the section titled Understanding ZFS Pool Types

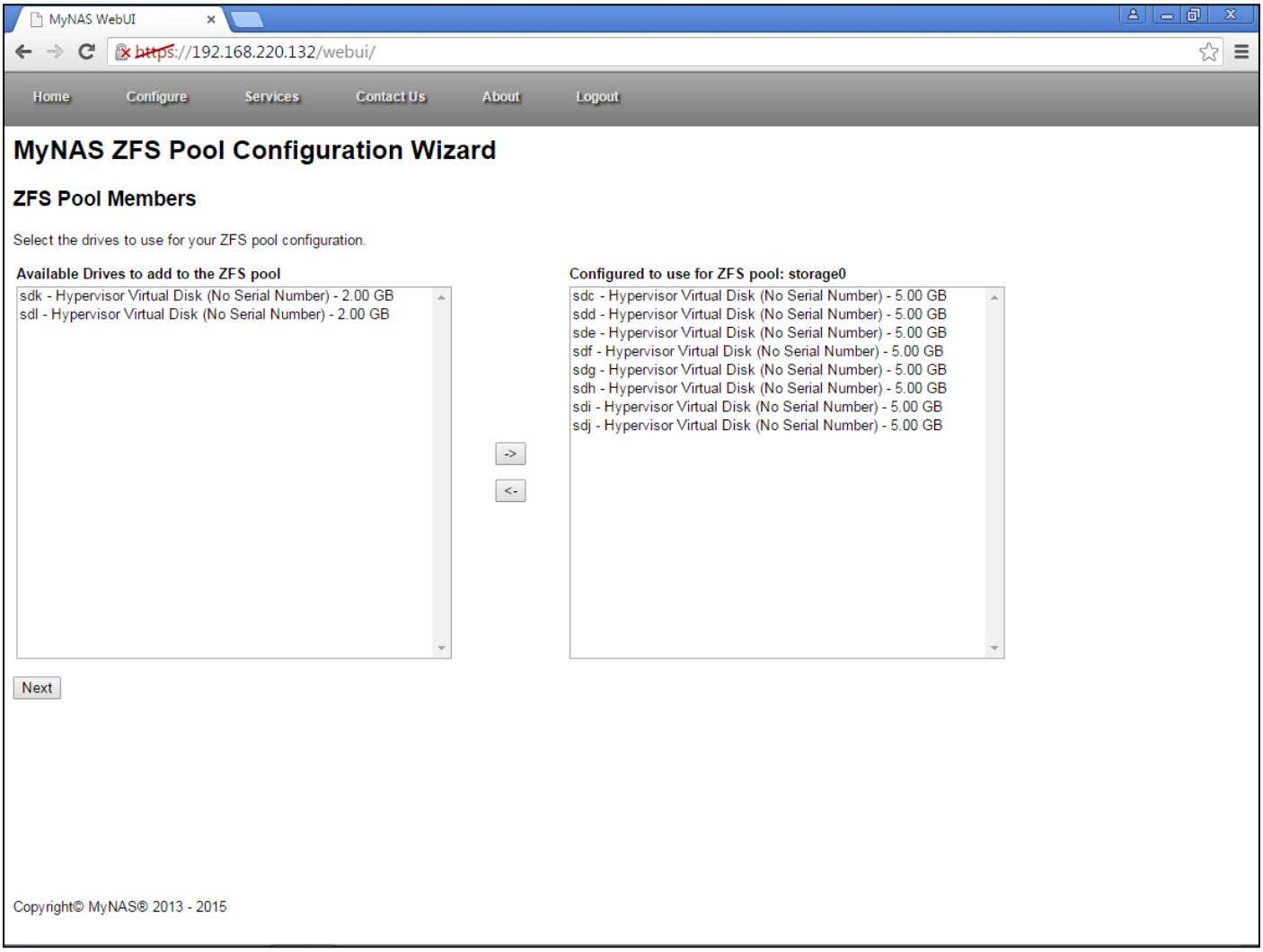
Select all the disks that you wish to use for this ZFS Pool.

Note: If you have disks for advanced functions such as ZFS Intent Log (ZIL), ZFS Cache (L2ARC) or to be used as a spare disk, do not select these disks at this time.

Note: If you are adding a significant number of disks to a single ZFS pool, MyNAS will automatically calculate the most appropriate optimised configuration for the number of disks selected. This optimisation is based on the following guidelines:

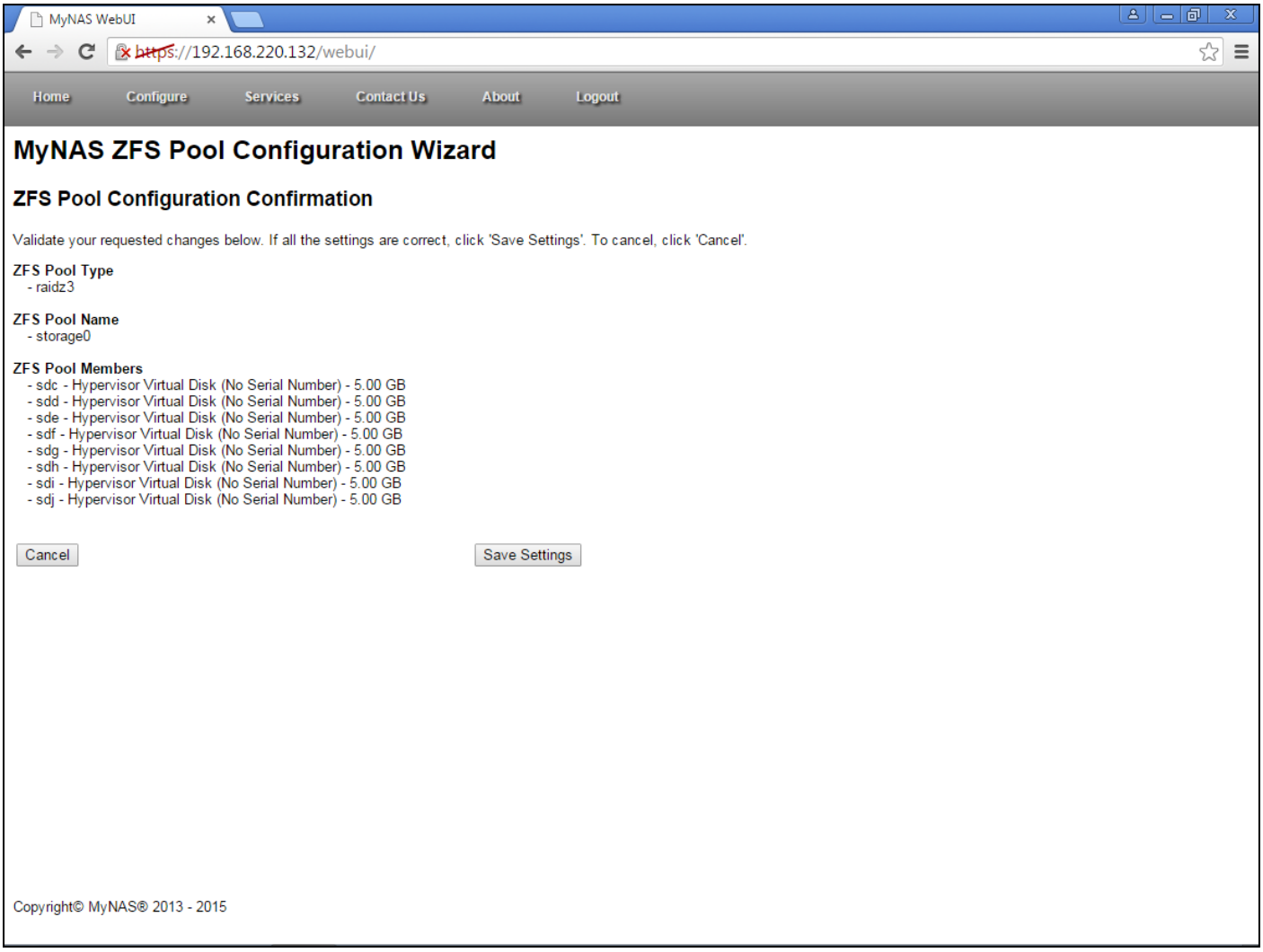
- For raidz1, do not use less than 3 disks, nor more than 7 disks in each vdev
- For raidz2, do not use less than 6 disks, nor more than 10 disks in each vdev
- For raidz3, do not use less than 7 disks, nor more than 15 disks in each vdev

If there are any unused disks after calculating the optimal configuration based on the number of disks and raidz level selected, these will not be used in the ZFS Pool and can be used for another purpose such as a spare disk(s).



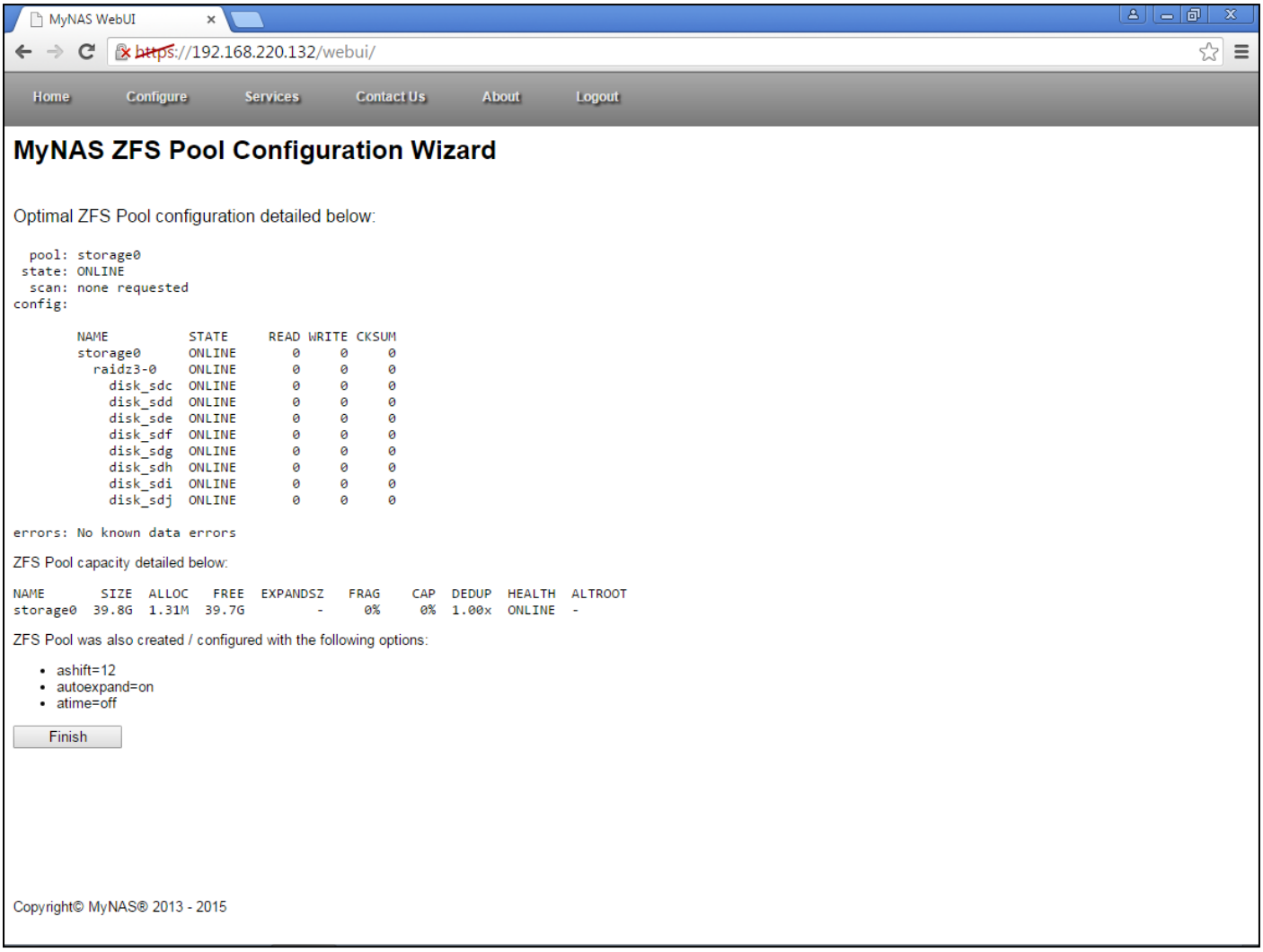
Once all the appropriate disks are selected, click 'Next' to continue.

MyNAS will now confirm all the changes you have requested for this ZFS Pool creation. If all the settings are correct, click the 'Save Settings' button to create the ZFS pool, or to cancel, click the 'Cancel' button.



To continue, click the 'Save Settings' button.

MyNAS will now process the ZFS Pool creation request, and list out the optimal ZFS Pool as created and display the result:



MyNAS creates the ZFS pool with the following additional options:

- Support for enhanced disk sector sizes (ashift = 12)
- Auto Expand (autoexpand = on)
- Access Time Recording (atime = off)

This allows MyNAS to:

- Use advanced format disks without the requirement to rebuild the ZFS pool
- Automatically expand the ZFS pool when replacing the disks with new, larger disks
- Not record file access time modifications as a speed improvement to MyNAS

In addition to the ZFS pool being created and to help check against issues, two automatic jobs have been scheduled to check the newly created ZFS pool:

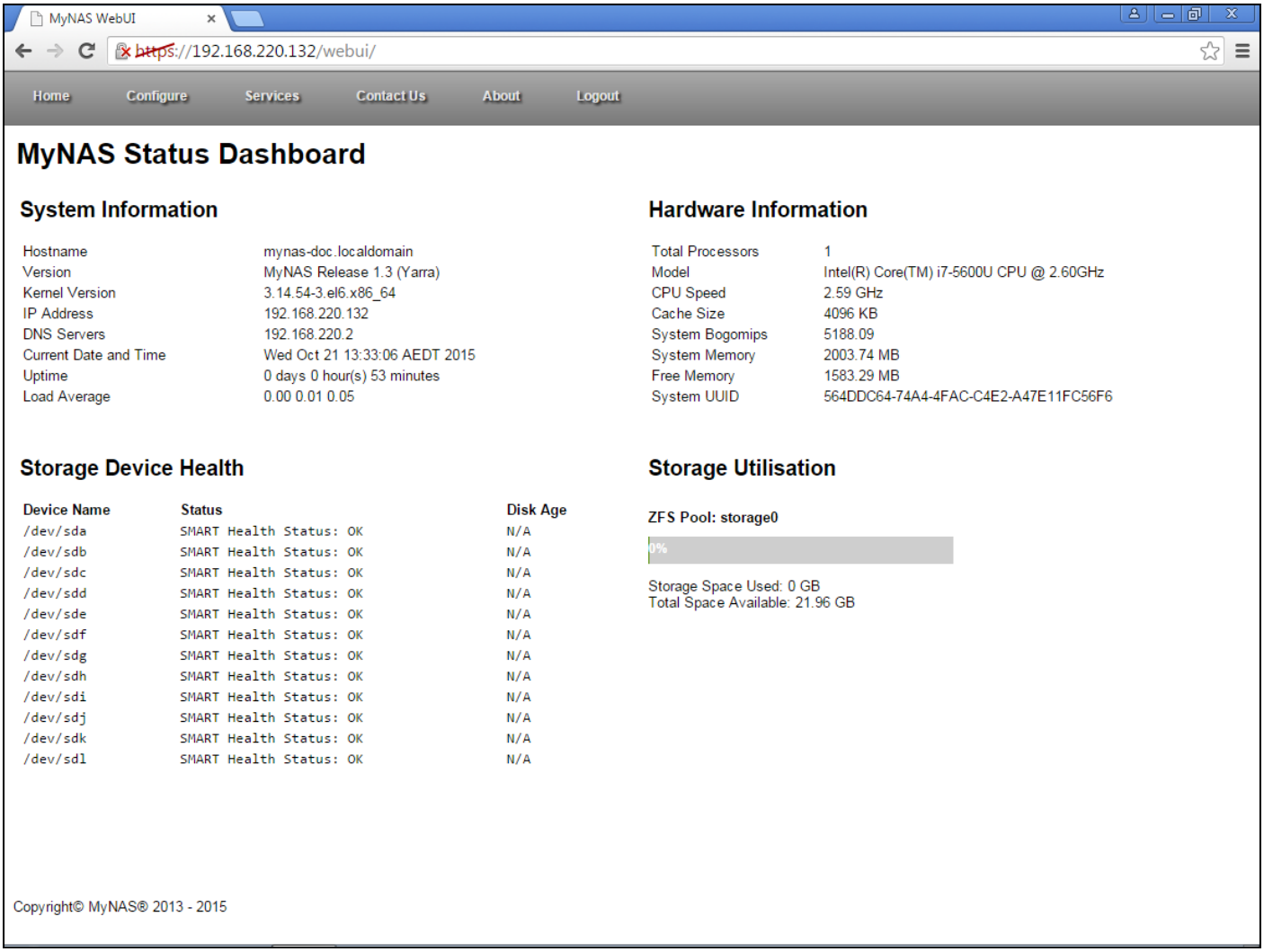
- A check every 5 minutes on the zpool status on the configured ZFS pool(s).
- A weekly scrub on the configured ZFS pool(s).

If any issues are discovered during these automatic checks, an email will be sent to the configured system notifications email address. An example of the email contents of when an issue is identified is detailed below:

```
  pool: blue
 state: DEGRADED
status: One or more devices could not be used because the label is missing or
       invalid.  Sufficient replicas exist for the pool to continue
       functioning in a degraded state.
action: Replace the device using 'zpool replace'.
   see: http://zfsonlinux.org/msg/ZFS-8000-4J
  scan: scrub repaired 0 in 0h0m with 0 errors on Sat Jun  1 16:56:44 2013
config:

       NAME          STATE     READ WRITE CKSUM
       blue          DEGRADED     0     0     0
         raidz1-0    DEGRADED     0     0     0
           disk_sdc  UNAVAIL      0     0     0
           disk_sdd  ONLINE       0     0     0
           disk_sde  ONLINE       0     0     0
           disk_sdf  ONLINE       0     0     0
           disk_sdg  ONLINE       0     0     0

errors: No known data errors
```

Click 'Finish' to return to the MyNAS WebUI home page.

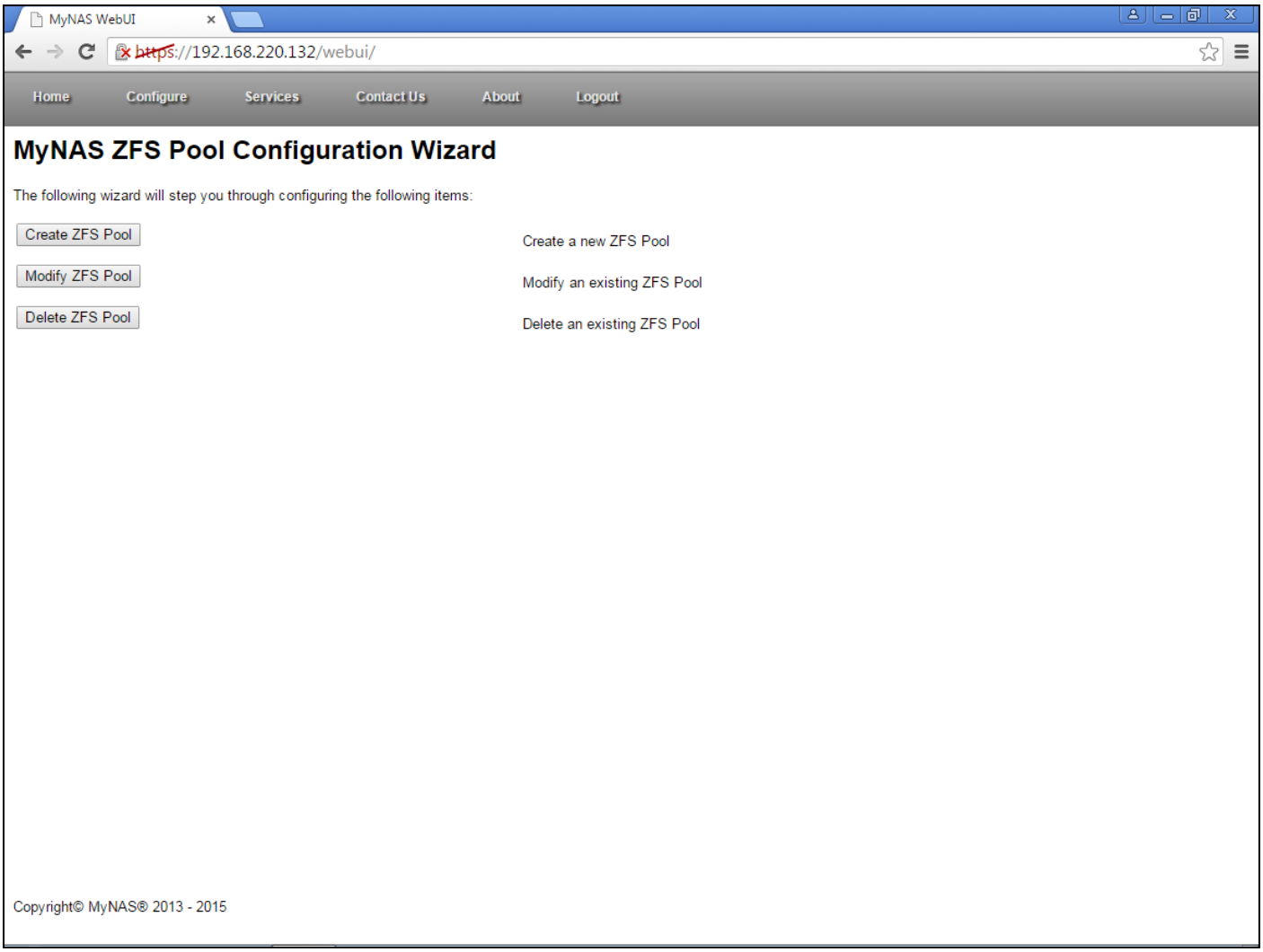
The MyNAS Status Dashboard now displays your ZFS Pool status and its storage utilisation for easy reference:



Modifying a ZFS Pool with MyNAS Storage Appliance

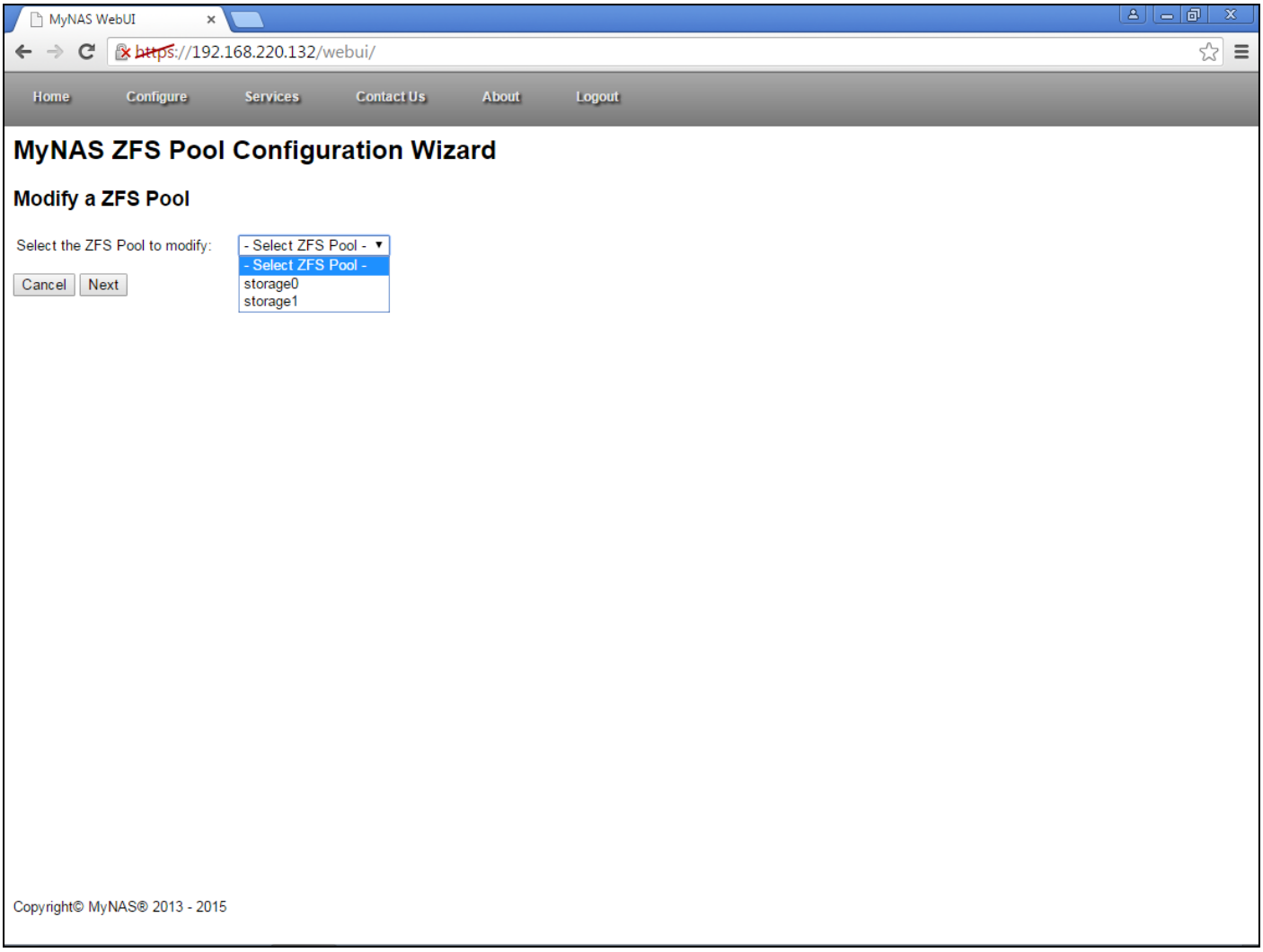
Modifying a ZFS pool allows the configuration of advanced functionality such as appending disks to an existing ZFS pool or adding disks for either ZFS Intent Log, ZFS Cache or ZFS Spare allocations.

From the WebUI login page, login as the enable user. Click on the 'Configure' menu bar item, and select 'Configure ZFS Storage' to bring up the ZFS Storage Creation wizard.



Click the 'Modify ZFS Pool' button to modify an existing ZFS Pool.

If there are more than 1 ZFS storage pool, MyNAS will prompt to select which ZFS storage pool to use for modification:

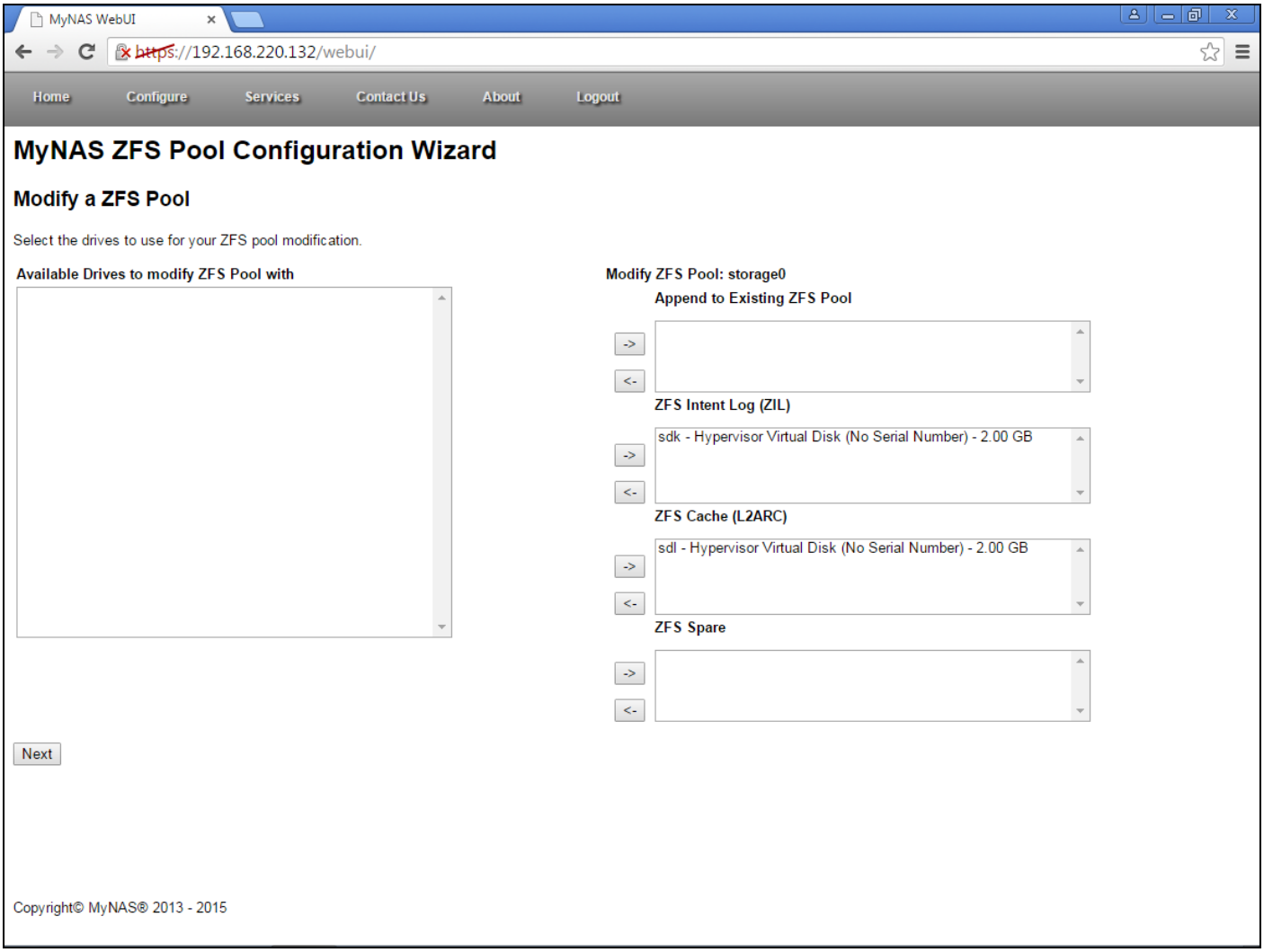


If applicable, select the appropriate storage pool and click 'Next'.

Select the modifications which you wish to make.

Note: When appending disks to an existing ZFS Pool, the number of disks selected must match the number of disks originally added. After adding the disks, the only way to release those disks is to destroy the ZFS pool.

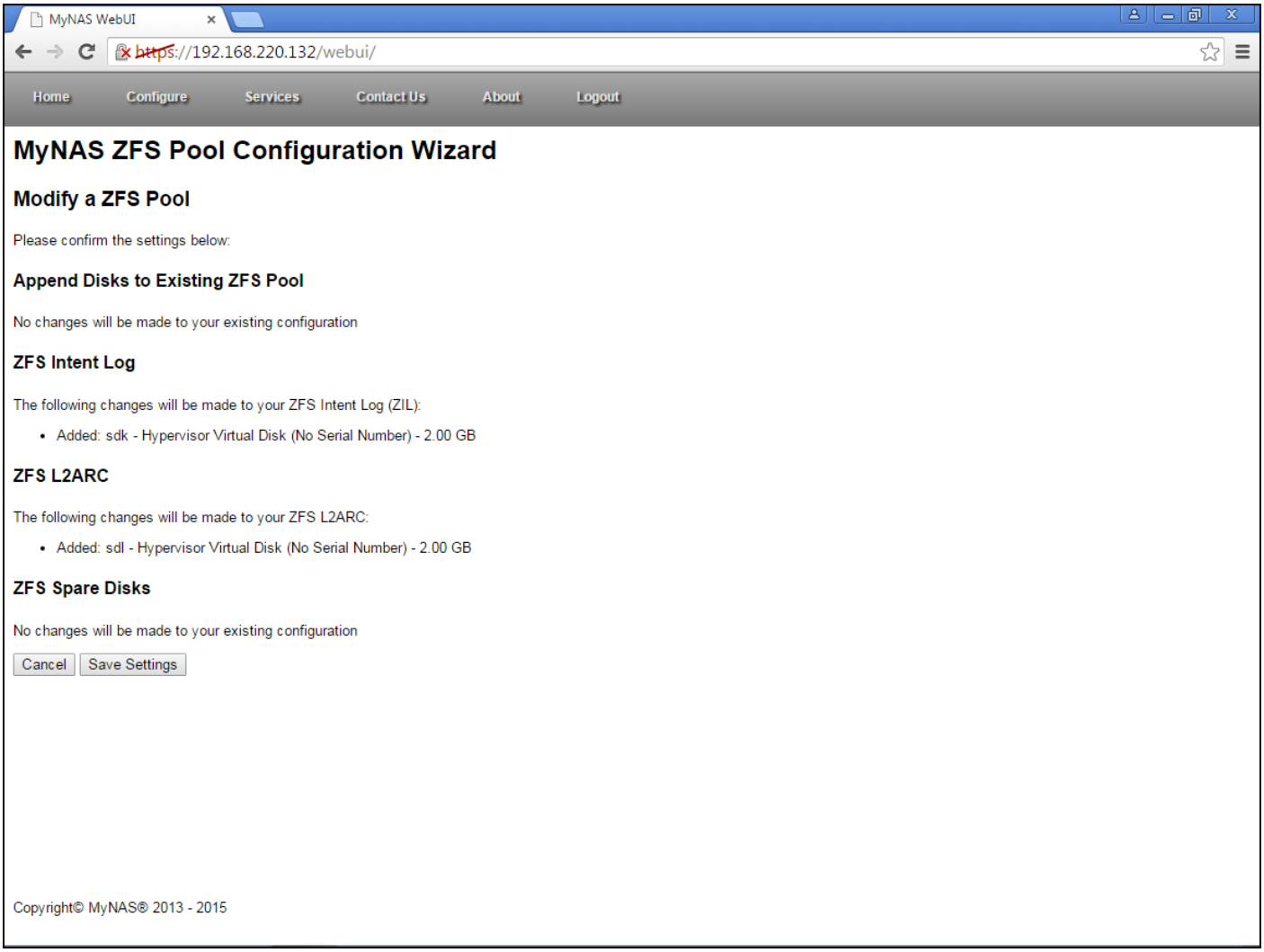
Note: When adding ZFS Intent Log, ZFS Cache or Spare disks, these can be added and removed, swapped around without requiring the destruction of the ZFS Pool.



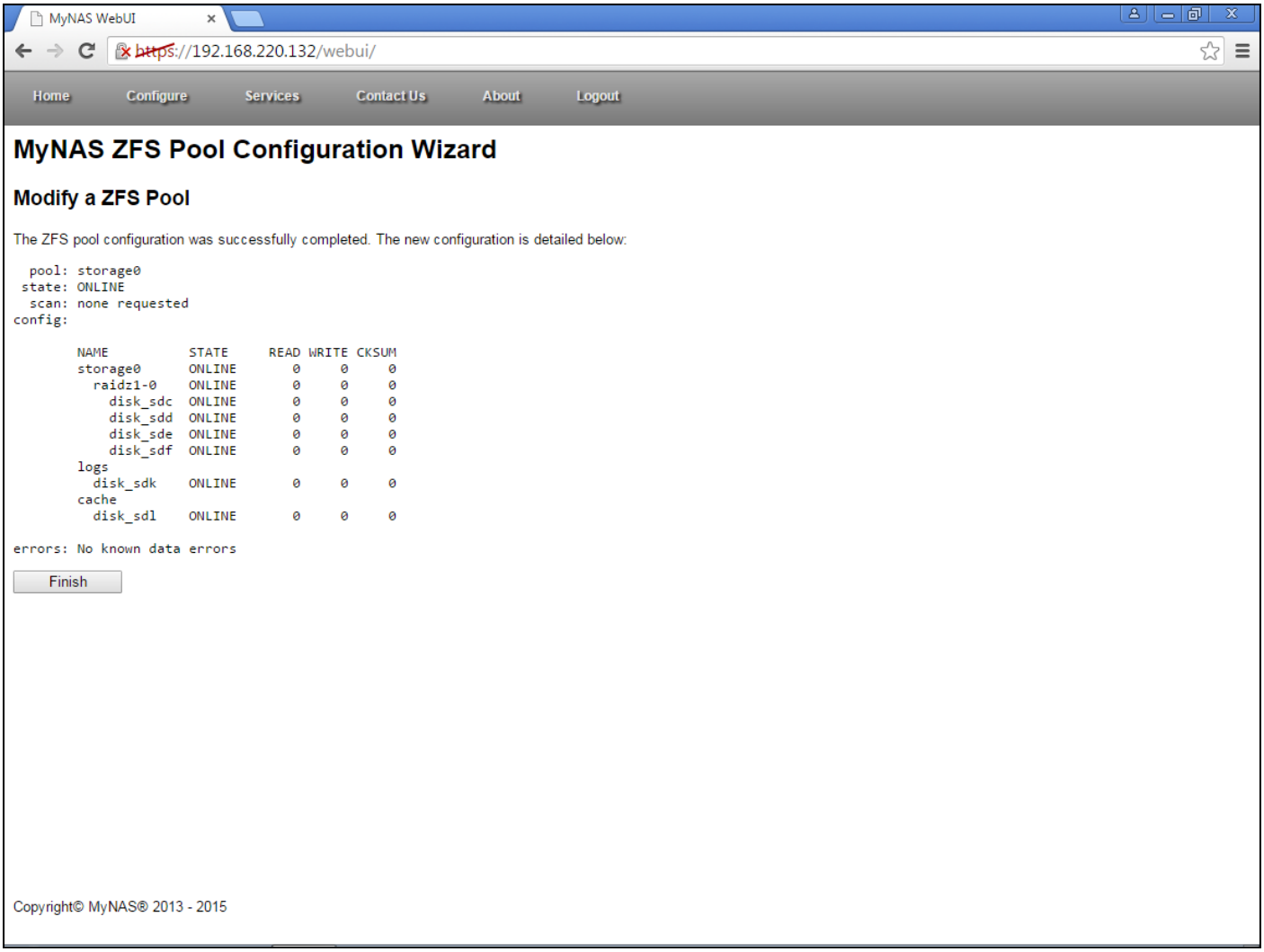
Once the modifications are made, click 'Next' to continue.

Note: When appending to the existing ZFS pool, the number of disks selected need to equal the existing ZFS pool size.

Confirm the settings as selected. If the settings are correct, click 'Save Settings' to activate the selected configuration.



Click 'Finish' to return to the MyNAS WebUI Home page.

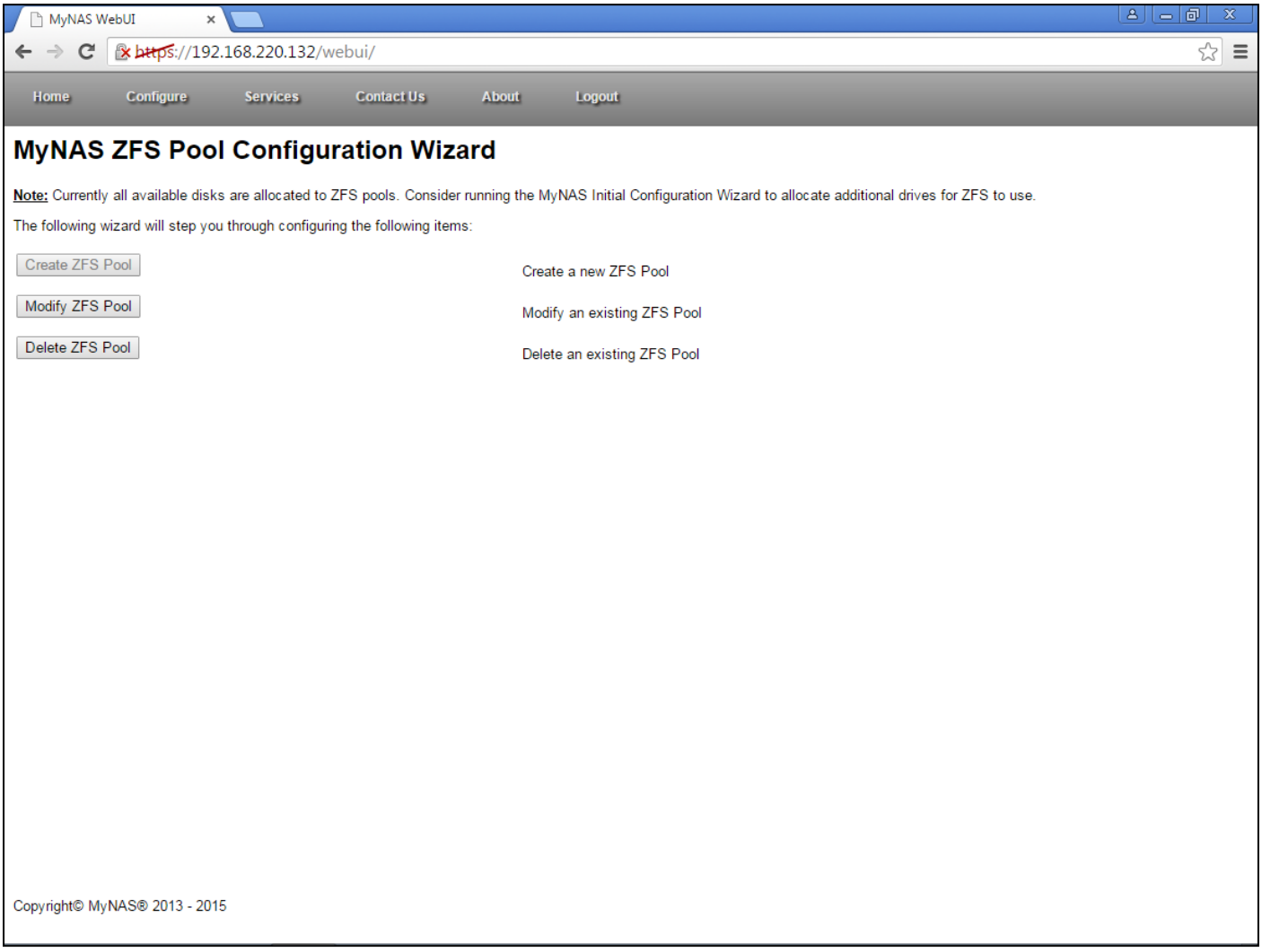


The ZFS Pool modifications are now complete for that selected ZFS Pool.

Deleting a ZFS Pool with MyNAS Storage Appliance

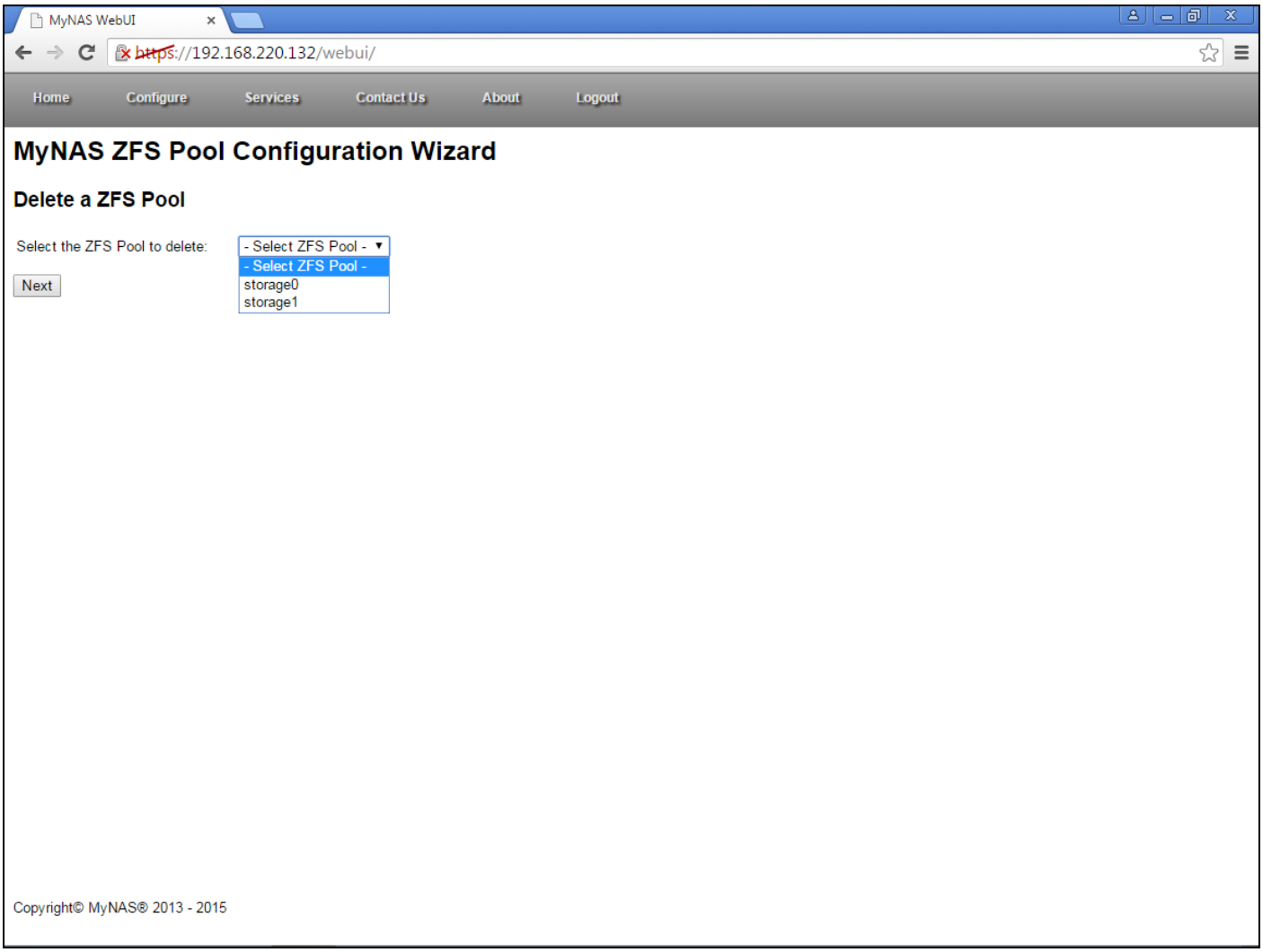
Deleting a ZFS pool is a destructive process. It will remove all data on the disks associated with the ZFS pool. If this action is undertaken by accident, in order to recover any data you may have to consult with data recovery specialists.

From the WebUI login page, login as the enable user. Click on the 'Configure' menu bar item, and select 'Configure ZFS Storage' to bring up the ZFS Pool Configuration wizard.



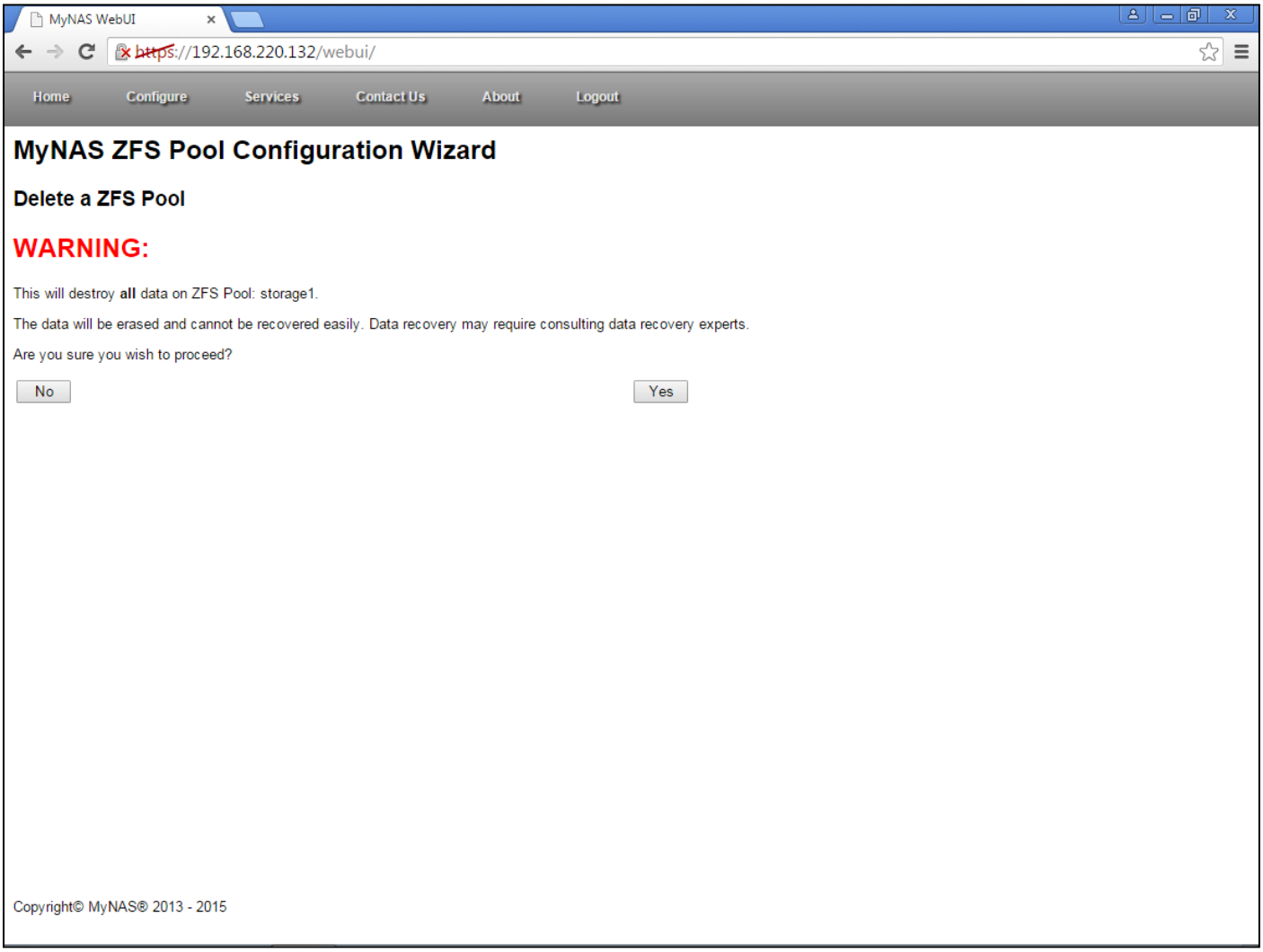
Click the 'Delete ZFS Pool' button to modify an existing ZFS Pool.

If there are more than 1 ZFS storage pool, MyNAS will prompt to select which ZFS storage pool to delete.



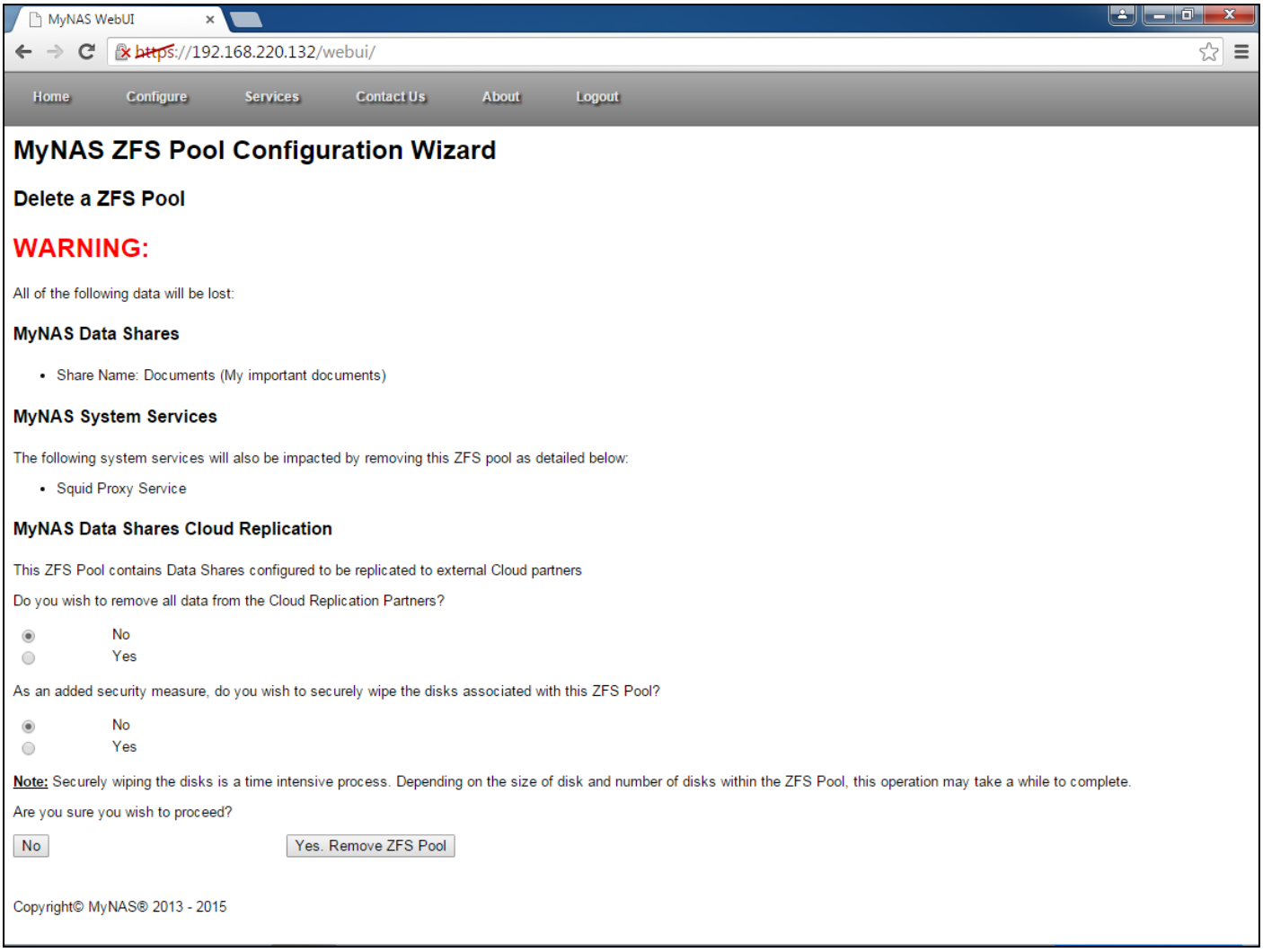
If applicable, select the appropriate storage pool and click 'Next'.

MyNAS will now warn you in regards to the action you're currently undertaking:



If you are sure of the action, click 'Yes' to proceed.

My NAS will now display all impacted data when the ZFS Pool will be removed. This helps prevent any accidental removal of a ZFS Pool:



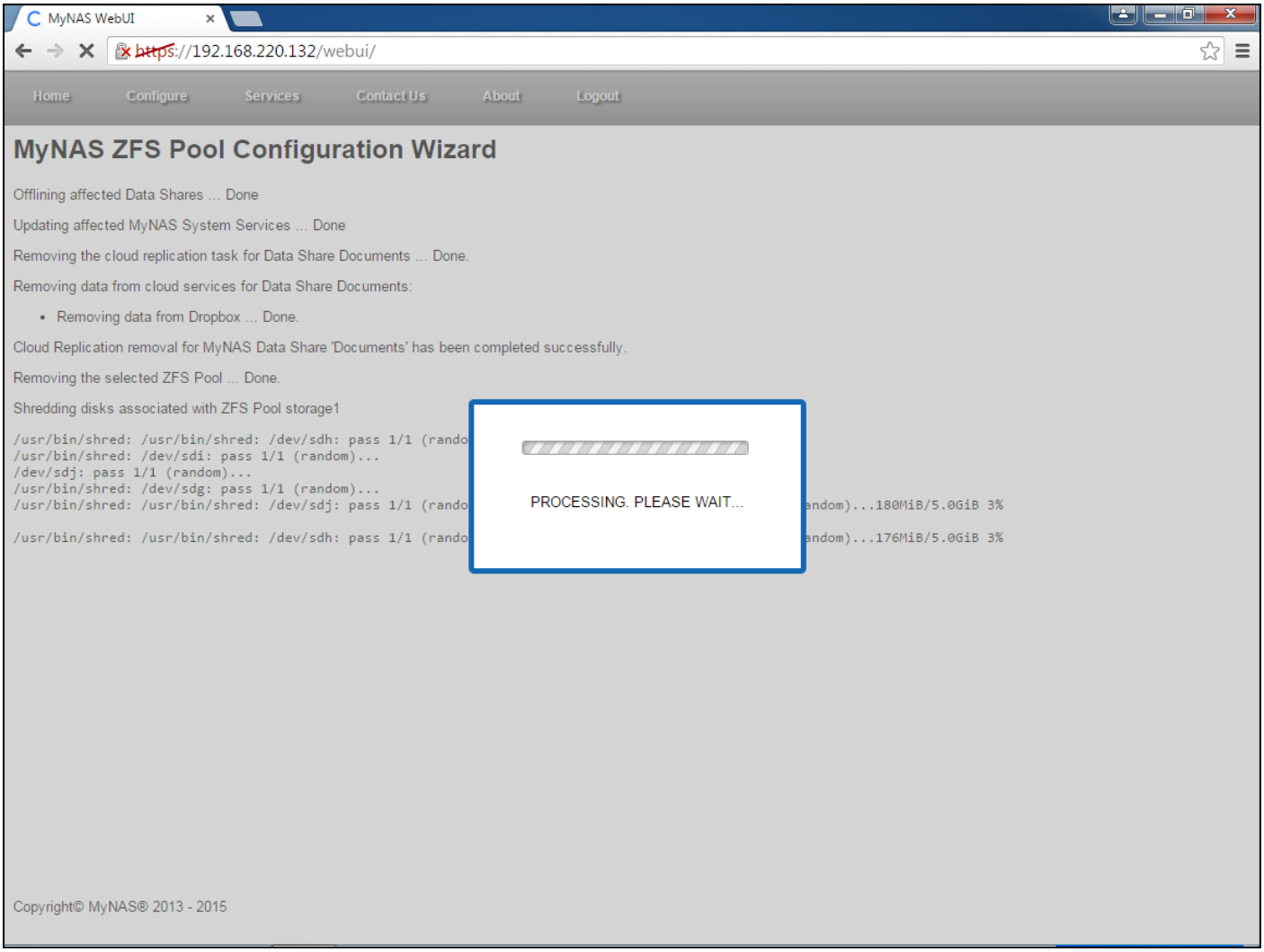
If any Data Share using this ZFS pool is configured to perform Cloud Replication, MyNAS will ask if you want to remove the data from all applicable Cloud Replication Partners. Click yes to perform this operation.

MyNAS also provides the option to securely erase the disks associated with this ZFS pool. Click yes to also perform this operation.

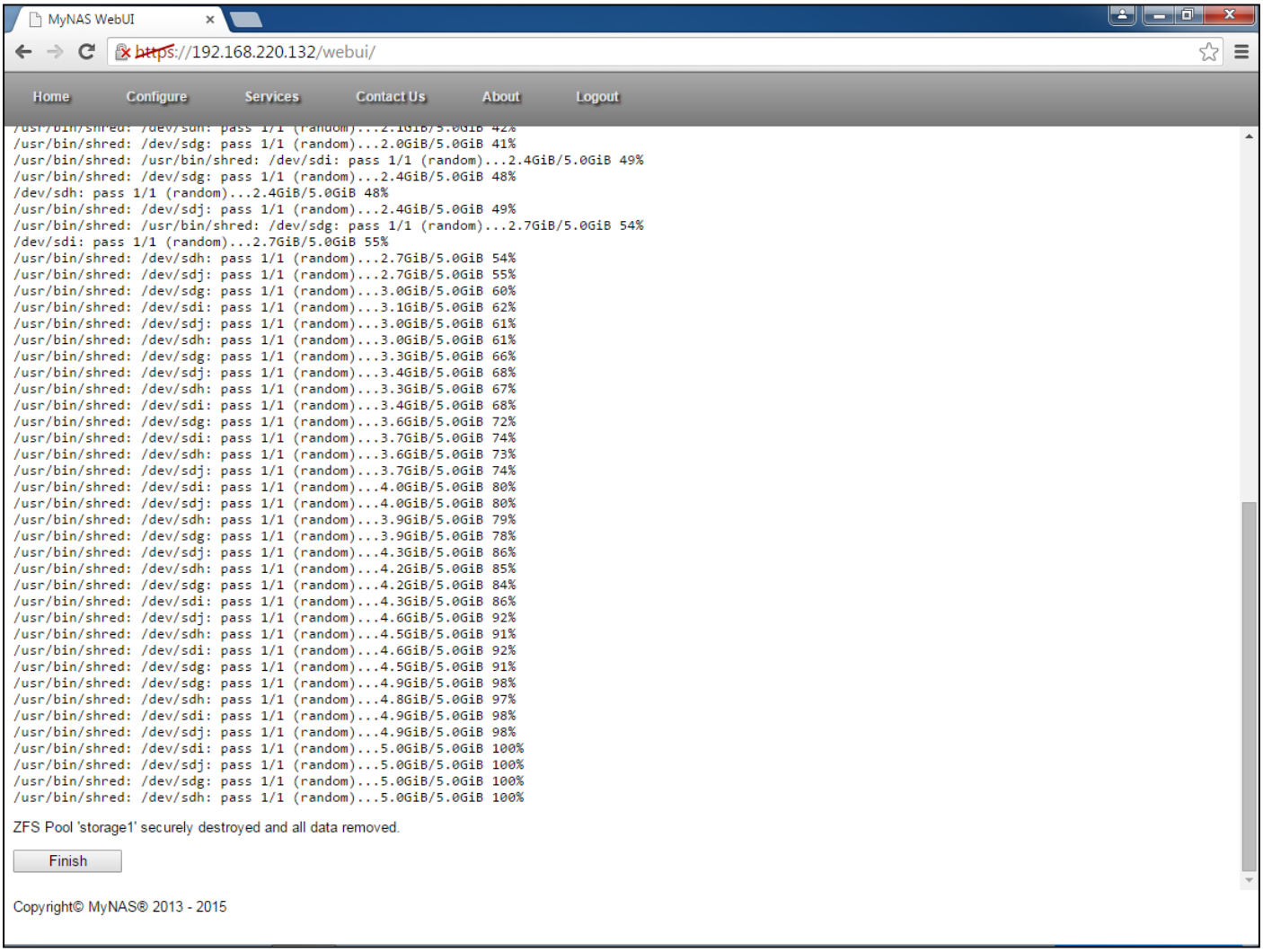
Note: The secure erase operation is a disk and time intensive process. Allow adequate time for the erase process to complete.

Clicking on the "Yes. Remove ZFS Pool" button will perform any addition actions selected and remove the selected ZFS pool.

The following will be displayed during the ZFS pool removal when securely erasing the disks is selected:



Once the ZFS Pool removal is complete the following will be displayed



Click Finish to return to complete the ZFS Pool removal task.

Using your MyNAS® Storage Appliance

There are a number of ways in which your MyNAS storage appliance can be used. The most common ways of using MyNAS are follows:

- Creating a Data Share for storing and sharing files from Windows, Apple OS X and Linux
- Configuring an iSCSI Target and mounting the iSCSI target in Windows or Linux

Additionally, MyNAS has the following capabilities:

- Protect your data by encrypting the data at rest
- Act as an Active Directory Server for Small to Medium Businesses
- Utilise local accounts or Active Directory authentication to protect access to your data
- Act as a local Web Proxy Server
- Act as a DLNA Server for DLNA Enabled TV's
- Act as a BitTorrent Client using Transmission
- Act as a central database for XBMC
- Act as a Virtualisation Platform utilising the XEN Linux virtualisation project

In all of these instances, any of your important data is now backed by ZFS providing integrity checking of any data you store on your MyNAS Storage Appliance.

Using Data Shares on MyNAS® Storage Appliance

Data Shares provide the capability to use your MyNAS storage appliance on your network as a file server so that you can:

- Share data between Windows, Linux or Apple OS X systems
  - Store additional copies for data integrity based on how you rate your data importance
  - Implement snapshots to protect your data
  - Encrypt your data at rest
- Share out the data via DLNA to other digital devices

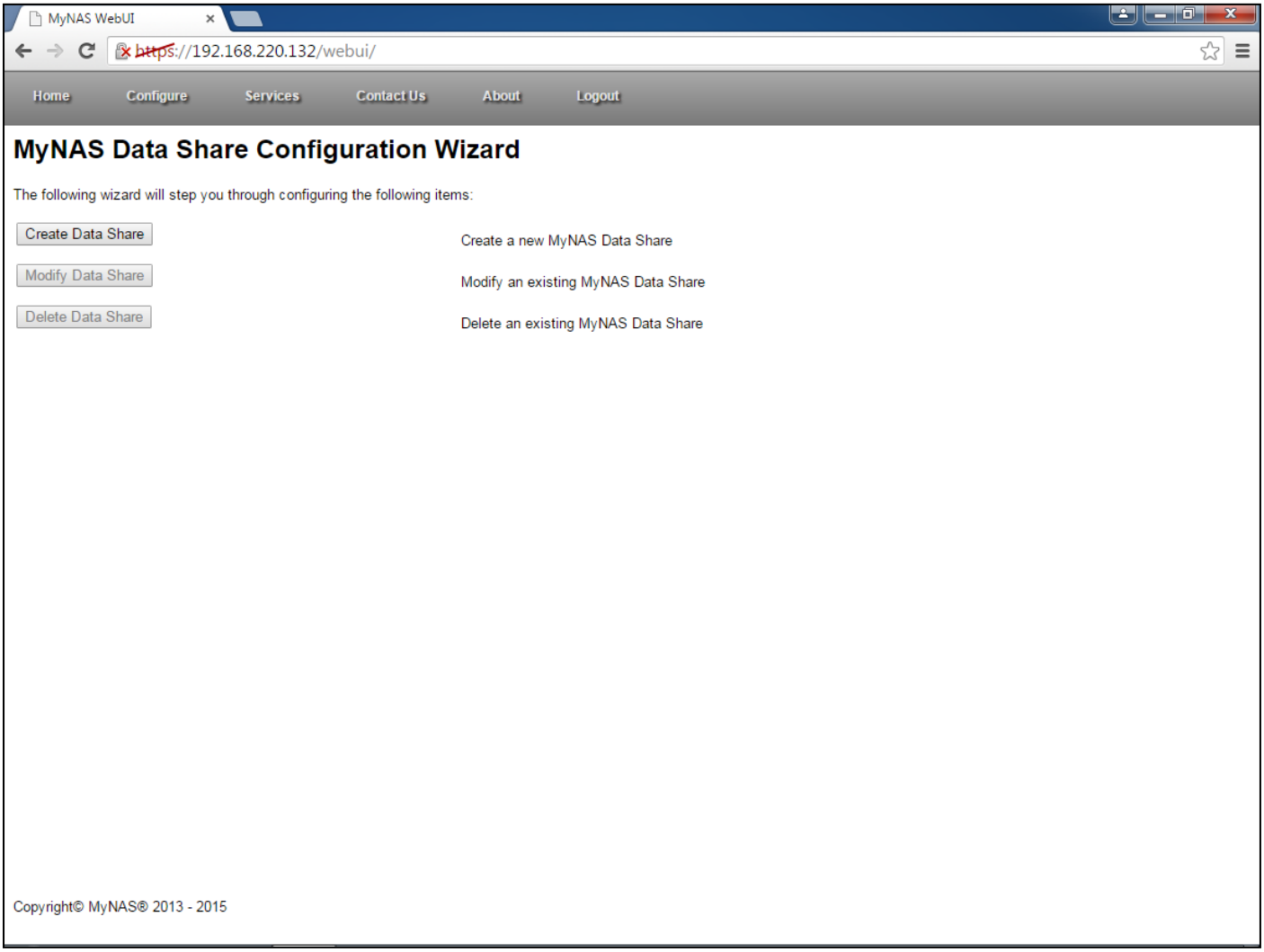
Additionally, each Data Share can be assigned security permissions to provide access control to your data.

Note: This section will focus on creating, modifying and deleting a Data Share. Working with user permissions will be handled in a separate section.

Creating a Data Share

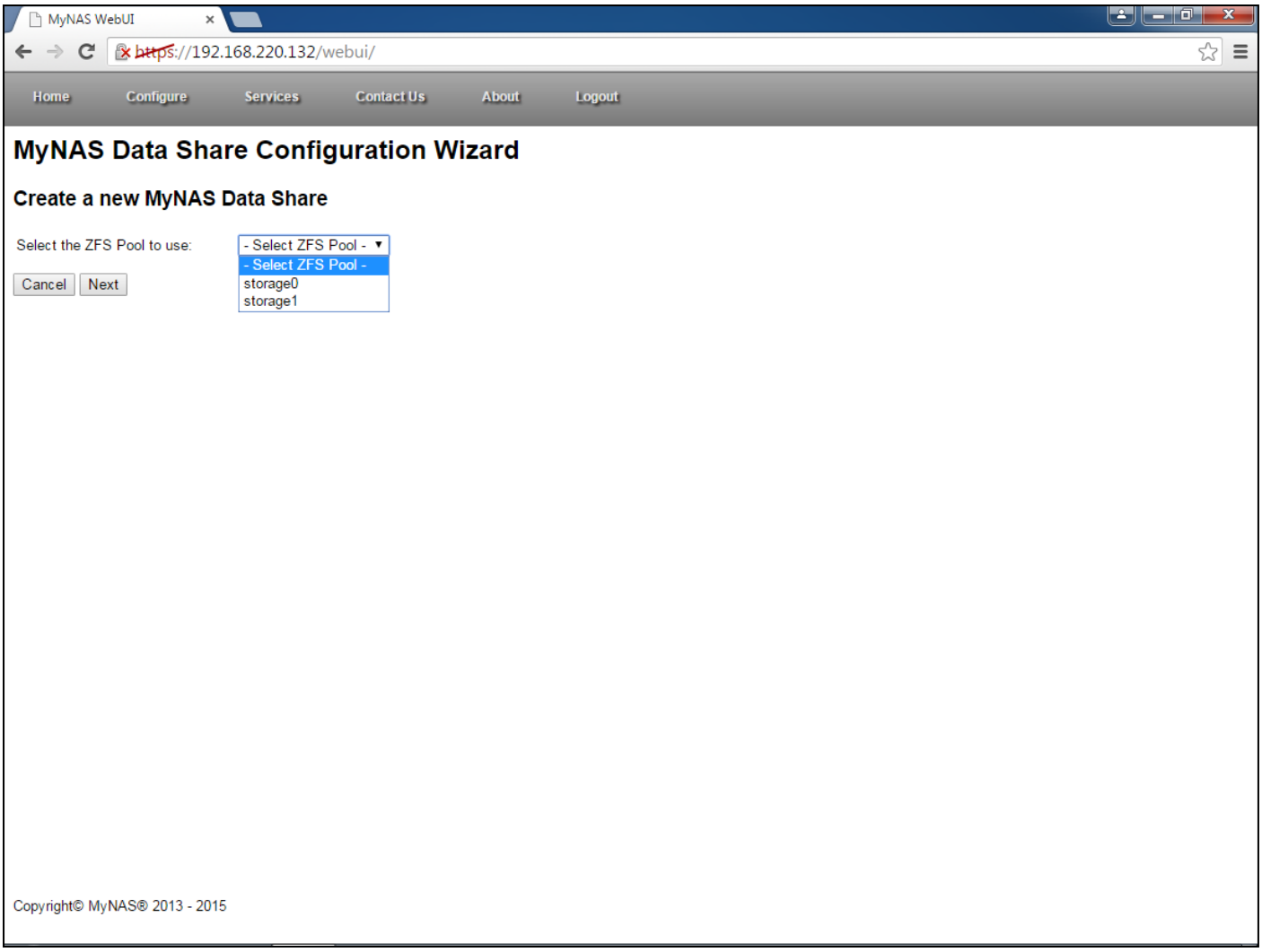
To create a Data Share on your MyNAS storage appliance, follow the directions below.

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Data Shares'. Once selected, the following will be displayed:



To create a Data Share, click on the 'Create Data Share' button.

Depending on the ZFS Pool configuration, if there is more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for the Data Share creation:

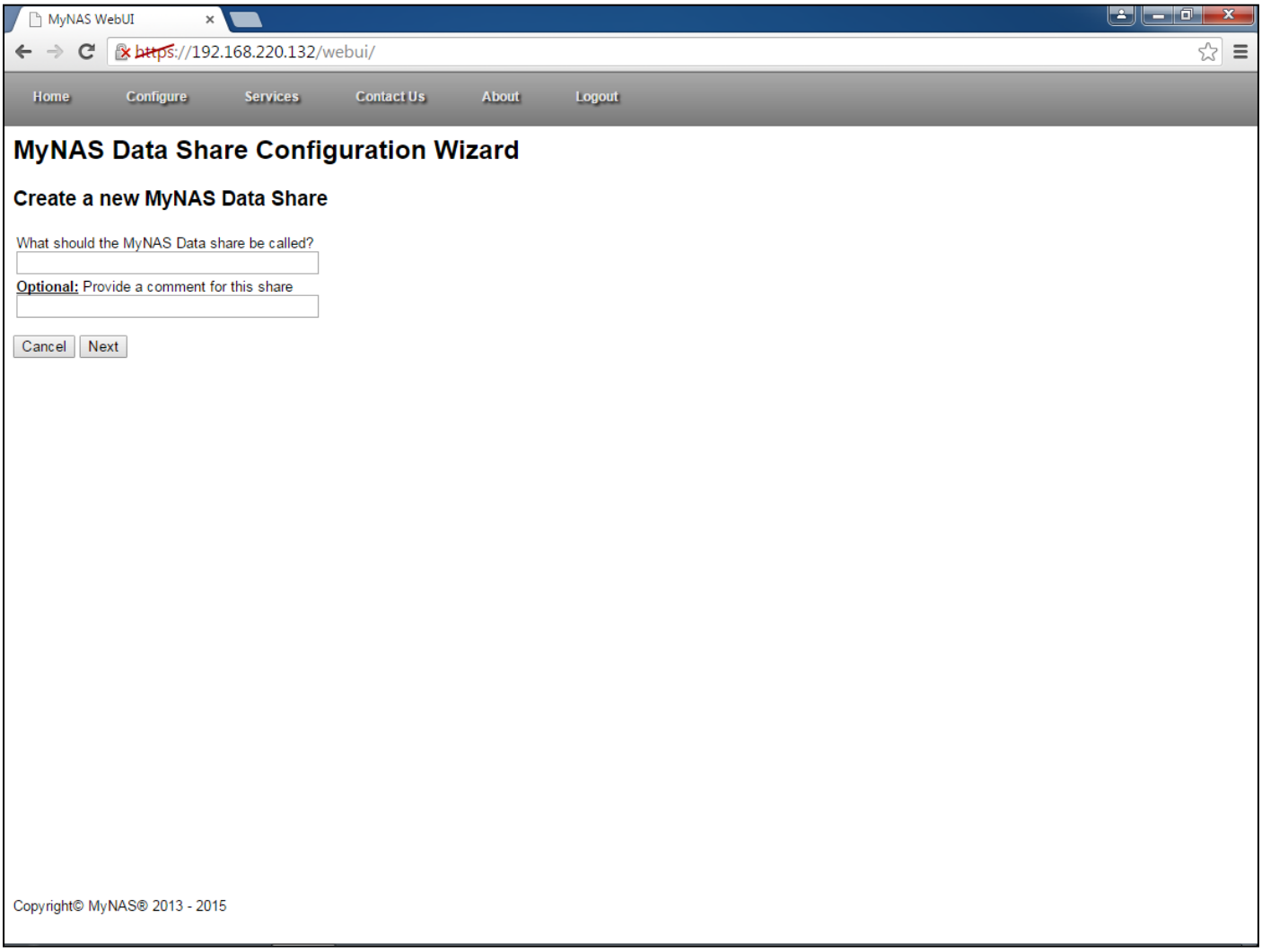


Select the appropriate ZFS Pool and click Next

Configure the Data Share with the appropriate details to identify this Data Share

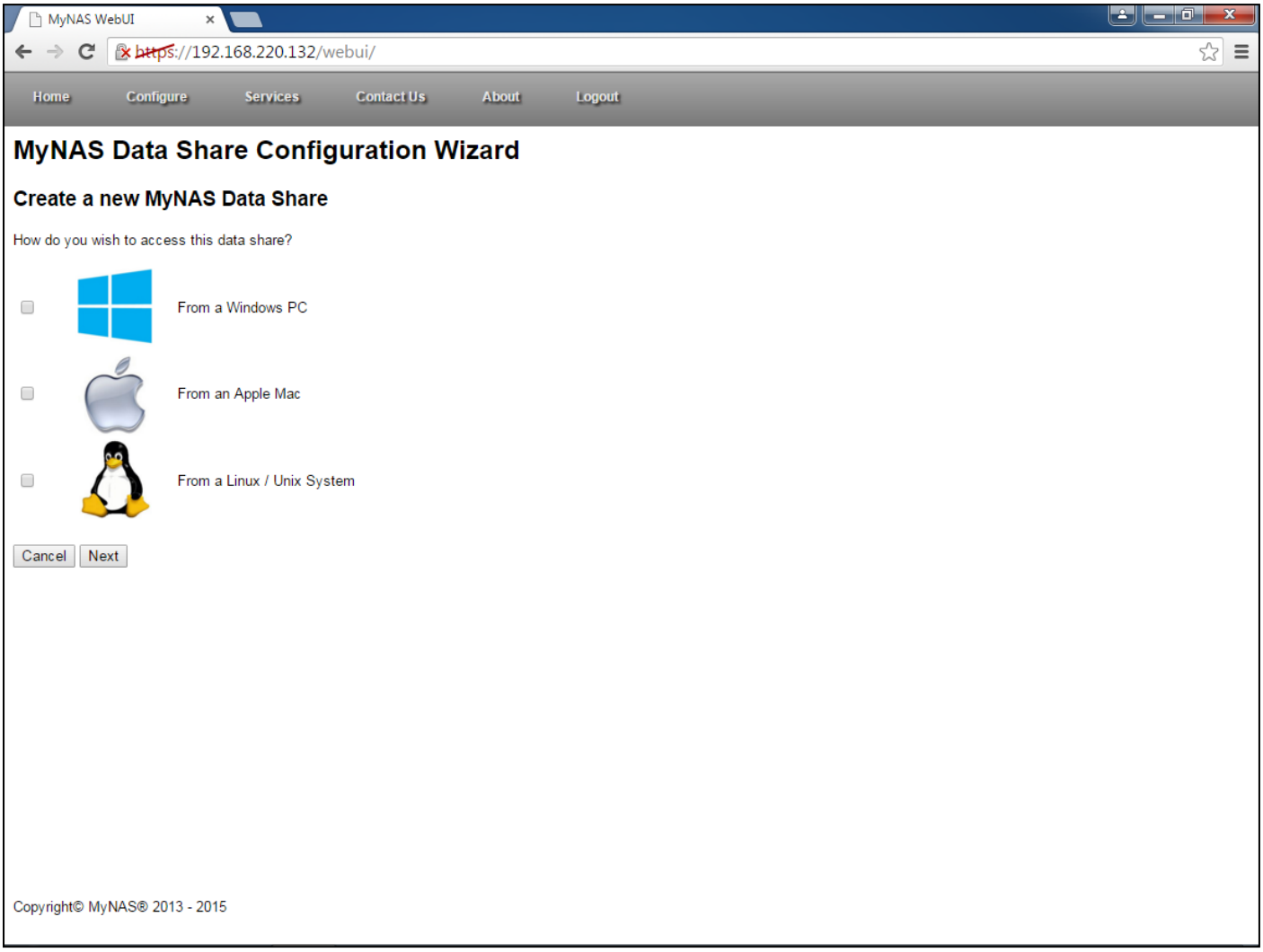
Note: The Data Share name can only contain alpha-numeric characters, including '-' and '_'

Note: The Data Share comment is as per the share name, however also including spaces and '.'



Once the new Data Share details have been configured, click 'Next'

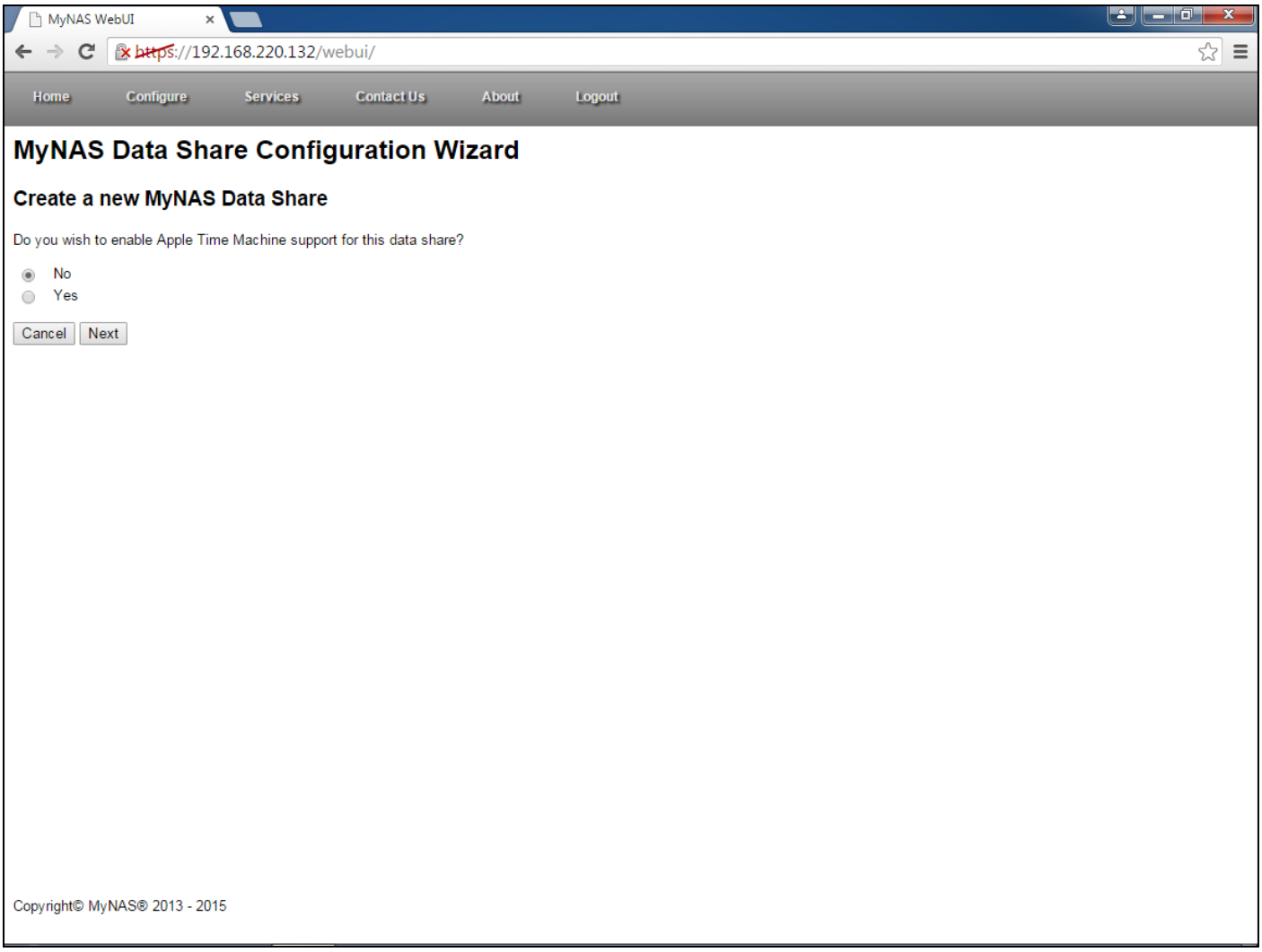
Select how you wish to access the Data Share. MyNAS supports accessing Data Shares from Windows, Apple OS X and Linux / Unix systems



Select the appropriate Data Share access mechanism's and click Next

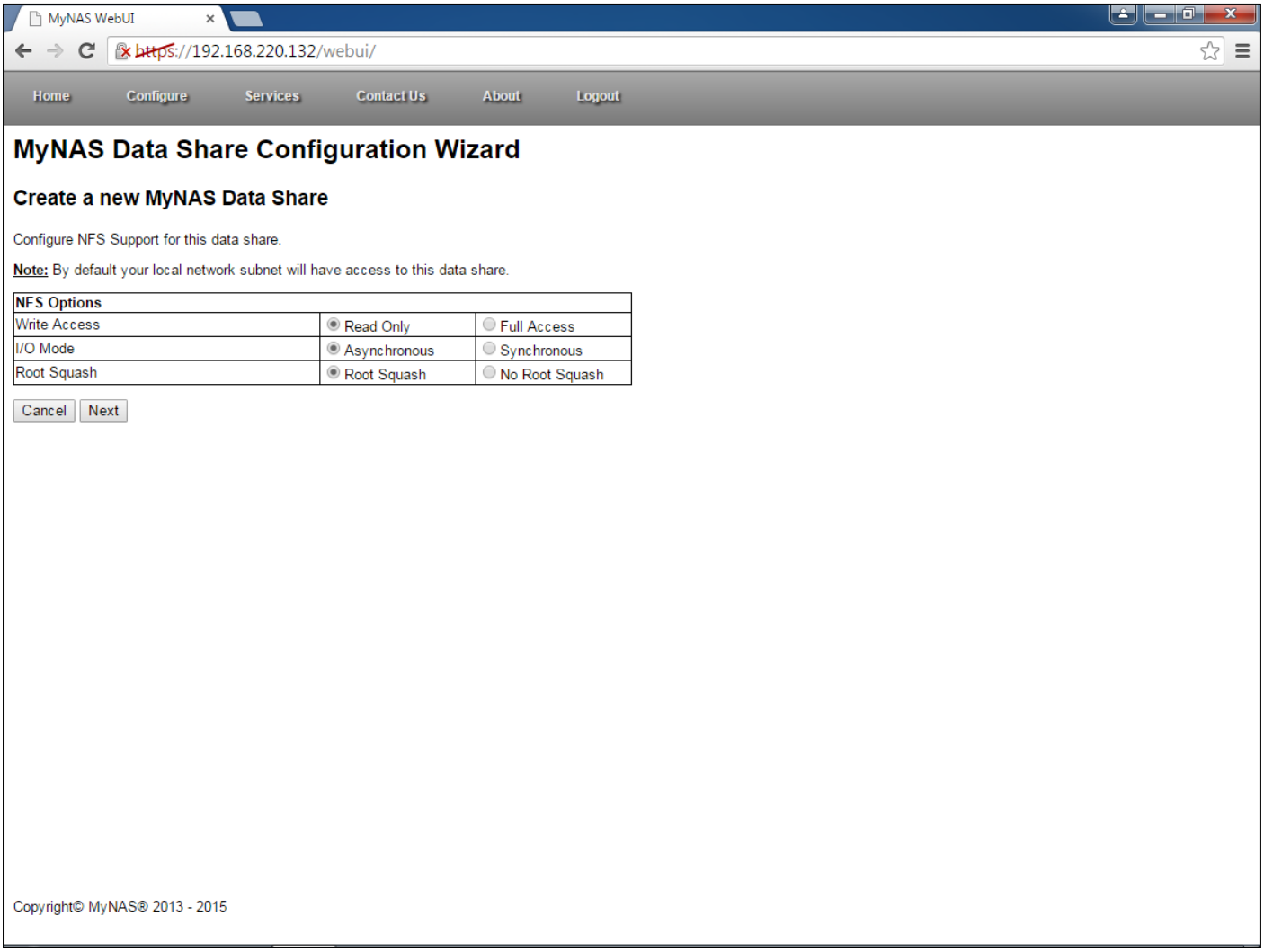
If Apple OS X was selected, will the data share be used to support Apple Time Machine? Typically a separate MyNAS Data Share should be configured for OS X Time Machine support.

Refer to the section titled 'MyNAS Time Machine Support' for details on how to setup Time Machine on OS X.



To continue click Next

If Linux / Unix support was selected, configure the appropriate NFS options for this Data Share



To continue click Next

Configure the data importance of this Data Share by using the sliding selector. This configures MyNAS to replicate the data internally for data safety. By default, MyNAS will only store 1 copy of each file on the system. By changing the data importance, this changes the copies of each file stored internally:

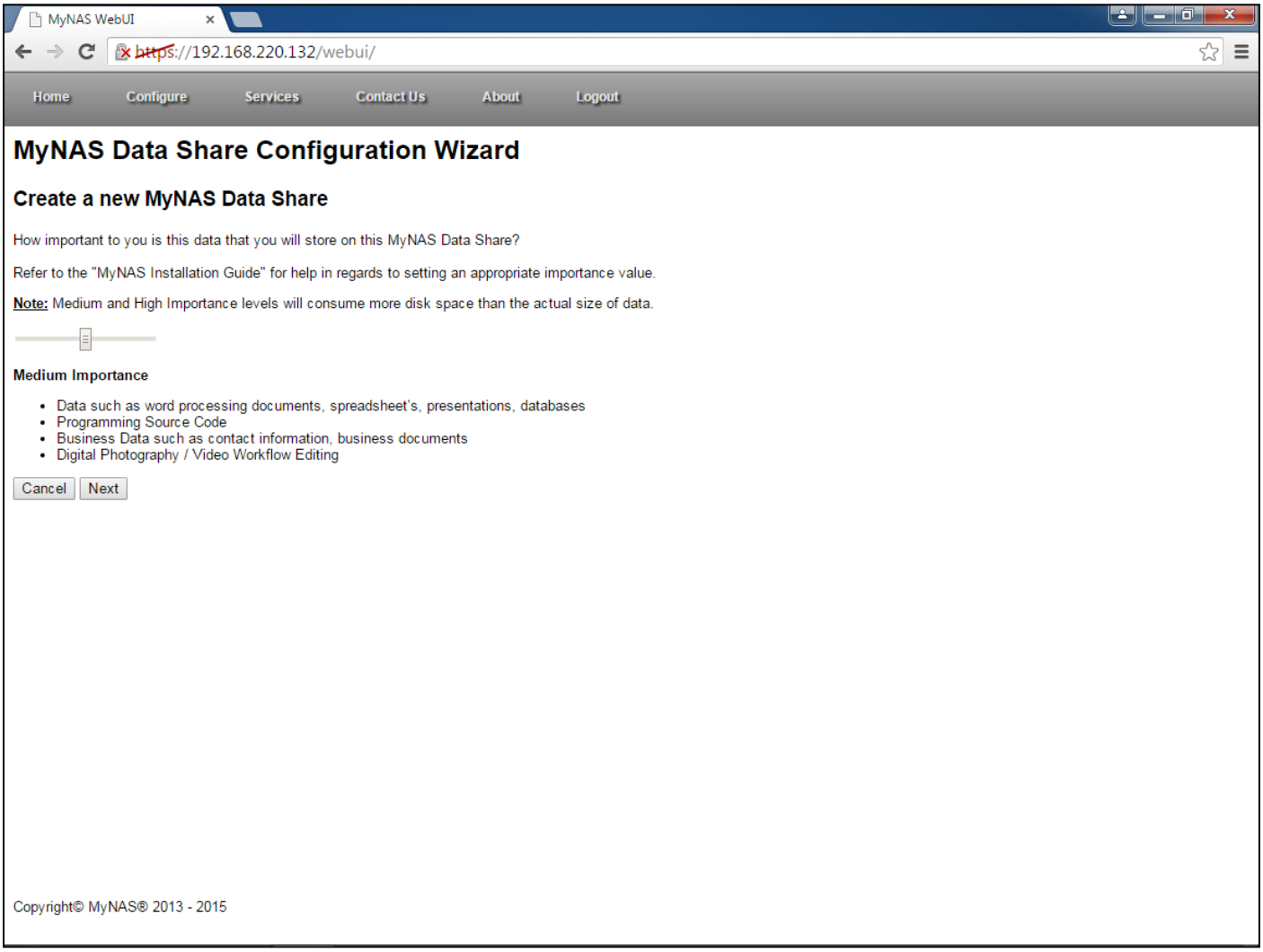
- Medium Importance will store two copies of the files. This will double your normal disk utilisation for this Data Share
- High Importance will store three copies of the files. This will triple your normal disk utilisation for this Data Share

Use the table below to help determine the most appropriate importance level for your data:

Data Type	Suggested Importance Level	Reason
Video data such as DVD / Blue Ray backups of physical media which you own	Low	This type of data is potentially sourced from physical media which you own. If you lose this copy, a new copy can be easily obtained or created.
Audio data such as music purchased online or backups of physical media which you own	Low	This type of data is potentially sourced from physical media which you own or downloaded from the purchase source. If you lose this copy, a new copy can be easily obtained or created.
Data such as word processing documents, spreadsheet's, presentations, databases	Medium	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
School / Higher Education Documents (Essay's, Presentations, Thesis, Project work)	High	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
Programming Source Code	Medium / High	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
Digital Memories including photo's, short home movies (such as those recorded via mobile devices), digital copies of non digital documents	High	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced

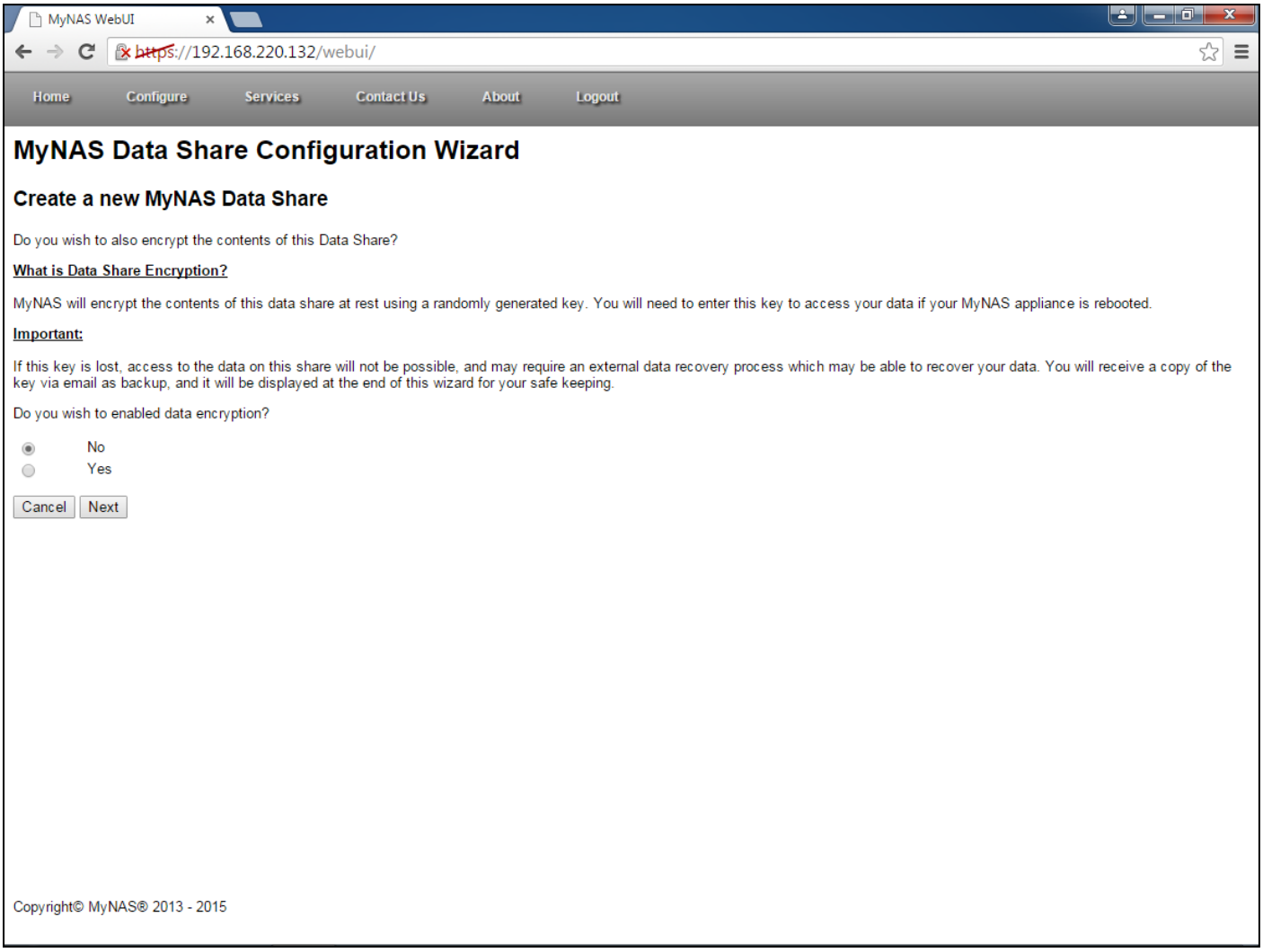
Data Type	Suggested Importance Level	Reason
Business Data such as contact information, business documents	Medium / High	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
Digital Photography / Video Workflow Editing	Medium / High	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced

Move the slider to configure the appropriate level of importance for your data that you will store on this data share:



Once the appropriate data importance has been selected, click 'Next'

All Data Share's regardless of data importance are able to be additionally safe guarded by encrypting the data stored within the Data Share.



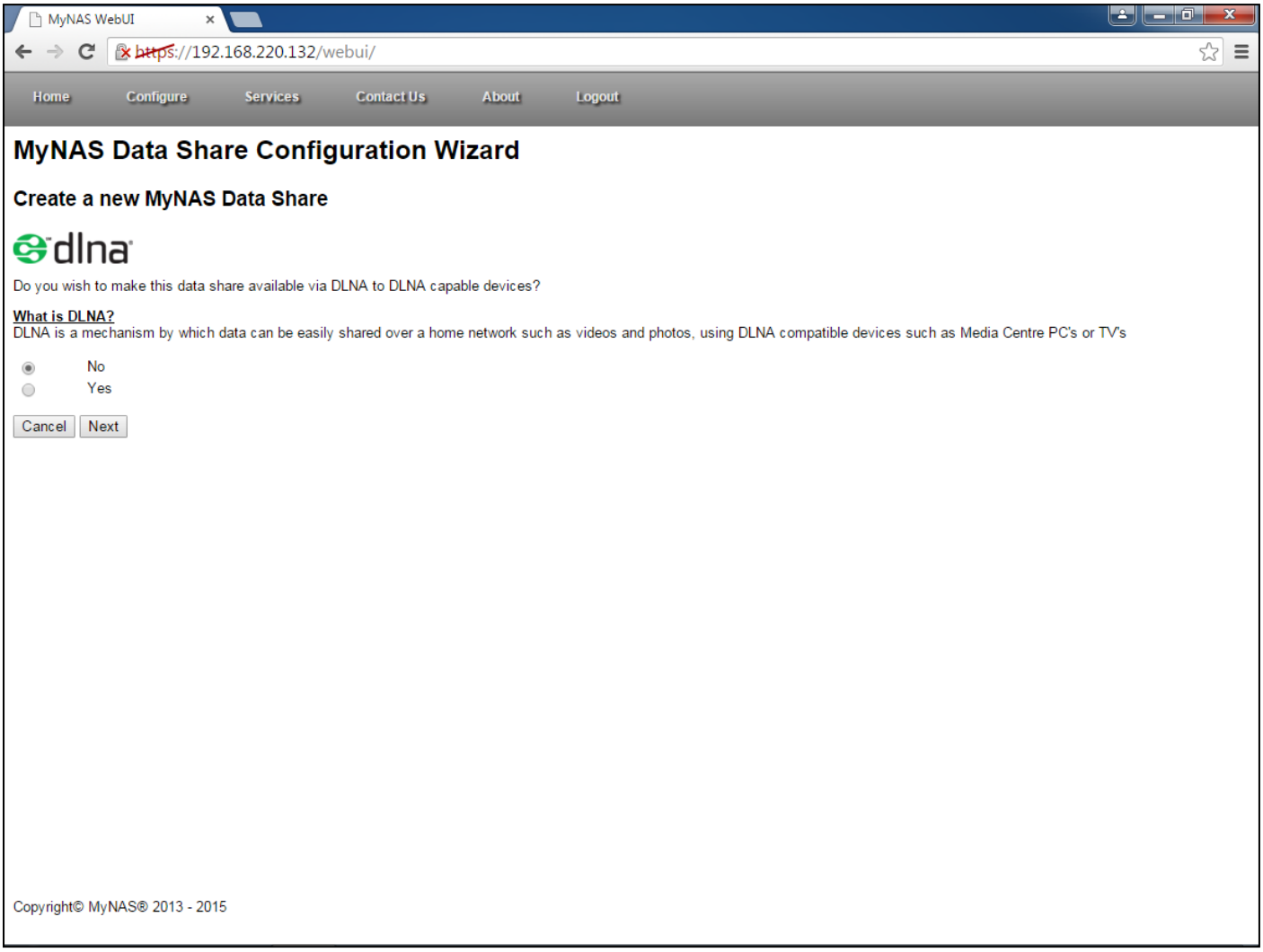
Select if you wish to encrypt the contents of this Data Share and click Next

Note:

When enabling Data Share Encryption, the following functionality is currently not available:

- Utilising the Windows Previous Version functionality
- Accessing an encrypted data share from a Linux or Unix system

If you would like the data being stored on this Data Share to be available via DLNA, configure the DLNA option as required:



Once the DLNA option is selected, click 'Next'

Creating ZFS Snapshot's is a highly beneficial feature of ZFS which allows rolling back to a specific point in time of any configured file system where for which a snapshot is created. It allows essentially the local recovery of accidental deleted or corrupted files.

Note: Snapshots should not be considered as a backup for your data. It is recommended that you take additional appropriate steps to backup your important data to a secondary (and potentially remote) system.

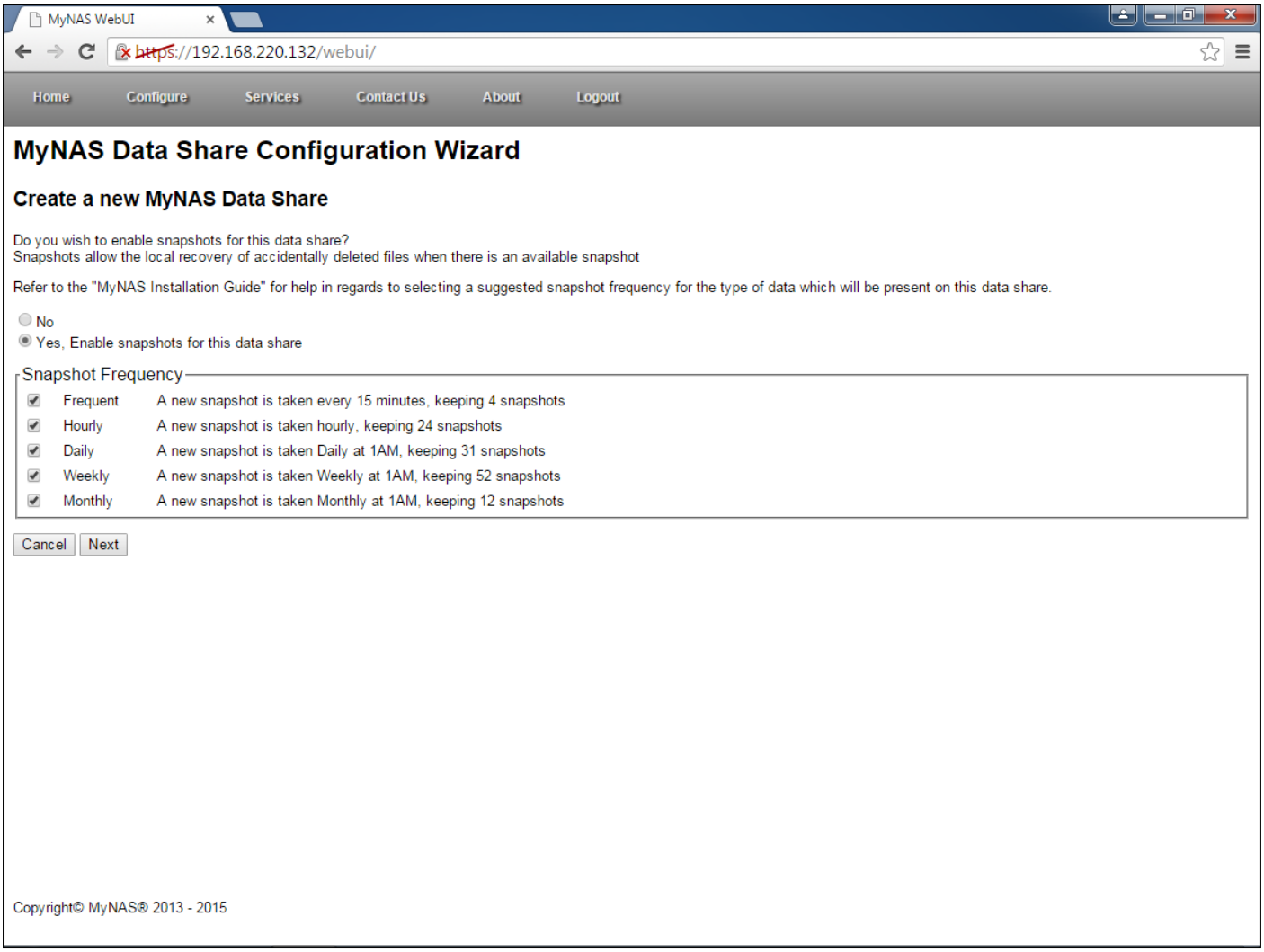
For any Data Share that you create and combined with the importance that you place on its data - the table below should guide you in determining if to snapshot the data and how often:

Data Type	Suggested Snapshot Frequency	Reason
Video data such as DVD / Blue Ray backups of physical media which you own	None	This type of data is potentially sourced from physical media which you own. If you lose this copy, a new copy can be easily obtained or created.
Audio data such as music purchased online or backups of physical media which you own	None	This type of data is potentially sourced from physical media which you own or downloaded from the purchase source. If you lose this copy, a new copy can be easily obtained or created.
Data such as word processing documents, spreadsheet's, presentations, databases	Hourly and Daily	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
School work / Homework	Hourly, Daily, Weekly and Monthly	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
Programming Source Code	Hourly, Daily, Weekly and Monthly	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced

Data Type	Suggested Snapshot Frequency	Reason
Digital Memories including photo's, short home movies (such as those recorded via mobile devices), scan's of non digital documents	Daily and / or Weekly	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
Business Data such as contact information, business documents	Daily, Weekly and Monthly	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced
Digital Photography / Workflow Editing	Hourly, Daily, Weekly and Monthly	This type of data contains potentially significant time and effort to create the initial content. The loss of this data could cause an impact and may not be able to be easily replaced

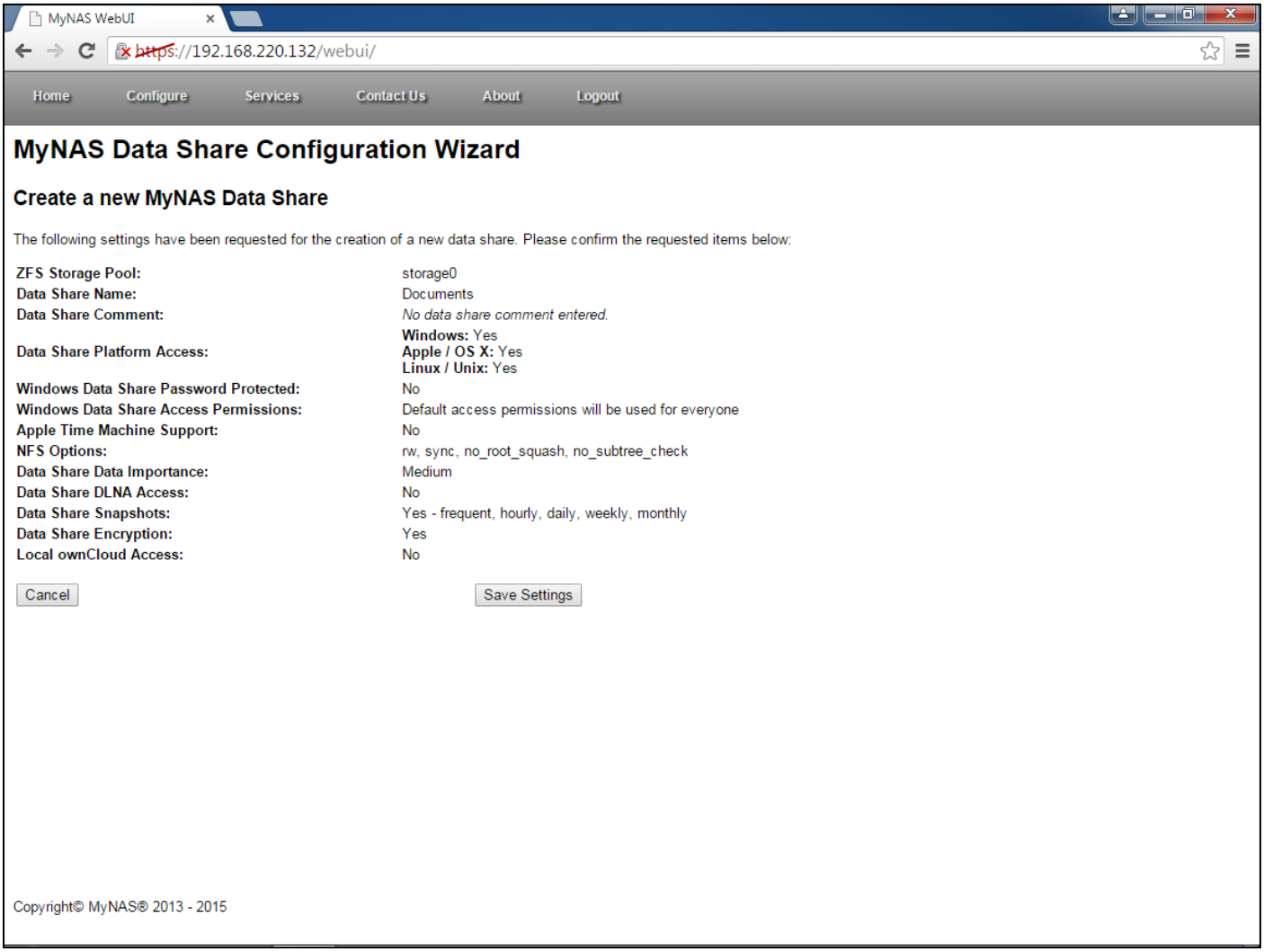
Depending on the frequency selected, this will dictate on the number of snapshots that are generated for that ZFS volume:

Snapshot Frequency	Snapshots Retained before roll-over	Size of Snapshot
Frequently	4	Any change in any file since the previous 15 minute snapshot was taken
Hourly	24	Any change in any file since the previous hour's snapshot was taken
Daily	31	Any change in any file since the previous daily snapshot was taken
Weekly	52	Any change in any file since the previous weekly snapshot was taken
Monthly	12	Any change in any file since the previous monthly snapshot was taken



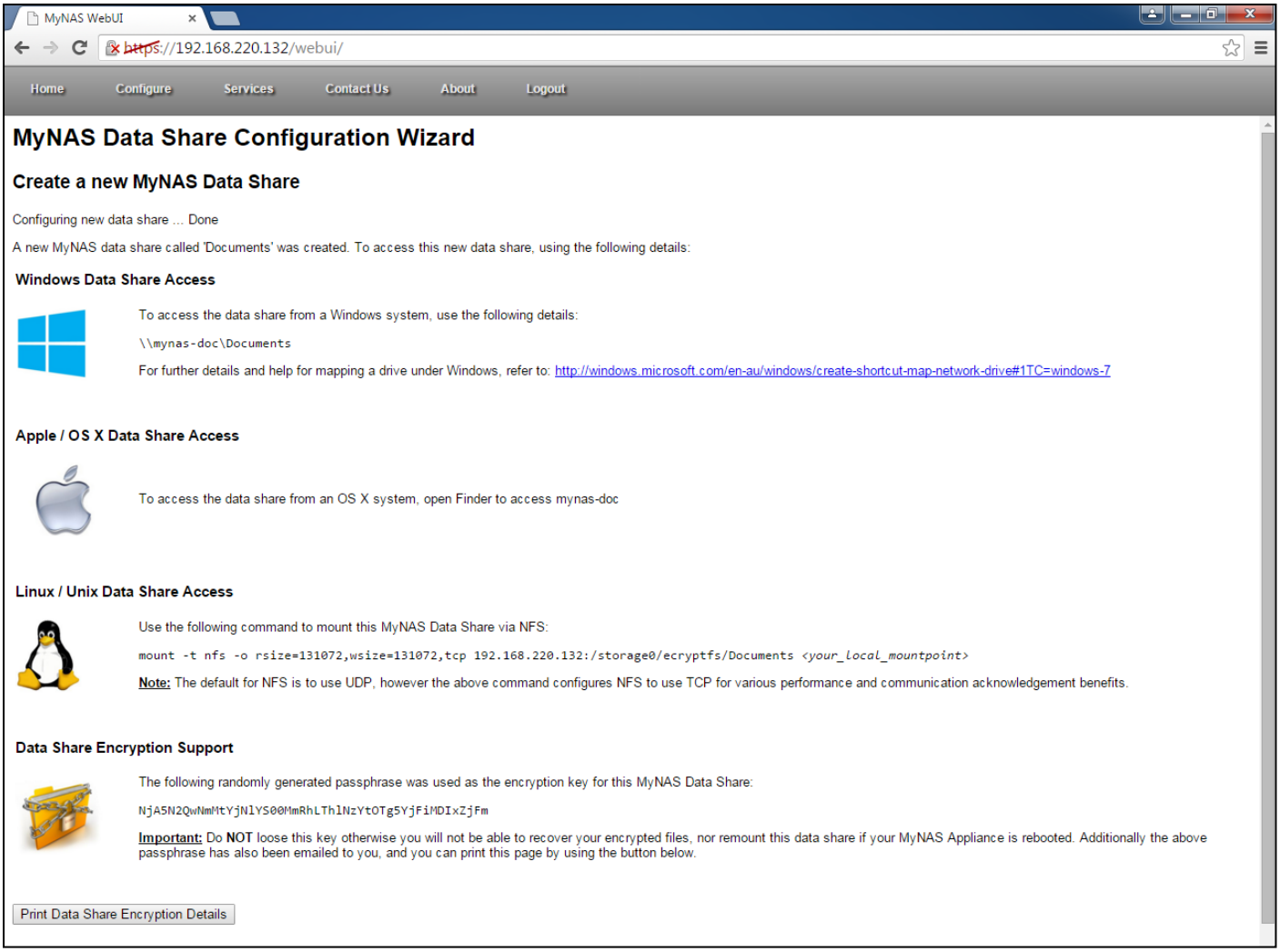
Select the appropriate snapshot frequency for the Data Share, and click 'Next'

Confirm the settings for this new Data Share:



Once all the settings are confirmed, click 'Save Settings'

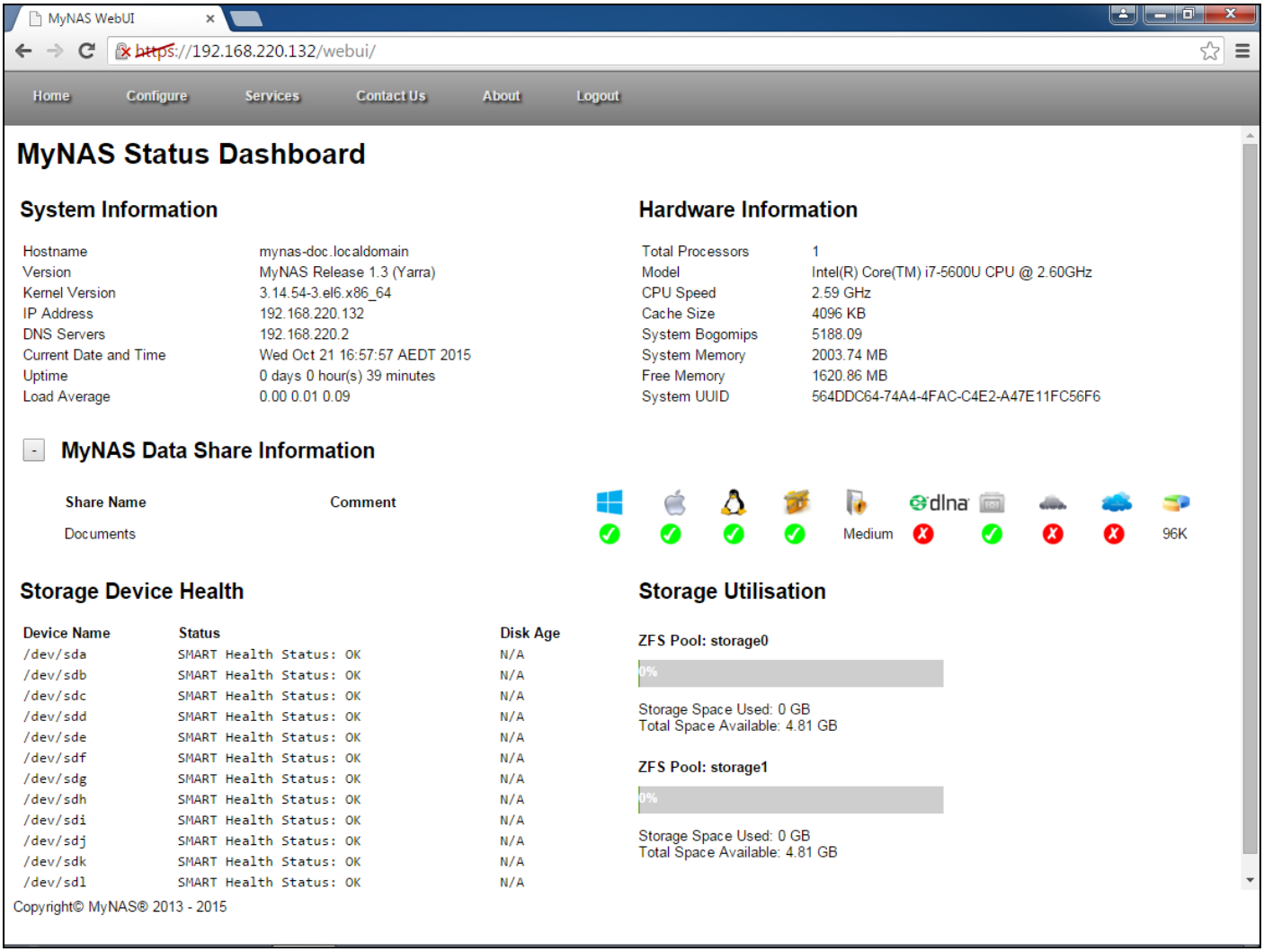
MyNAS will now process the Data Share creation request. Once complete the following will be displayed:



Note: If data share encryption was configured, an email will be sent your email address with the passphrase for this particular data share. You also have the opportunity to print the passphrase for your records.

Click 'Finish' to complete the Data Share creation wizard.

From the MyNAS Status Dashboard, a quick view is presented of any data shares configured on the system:

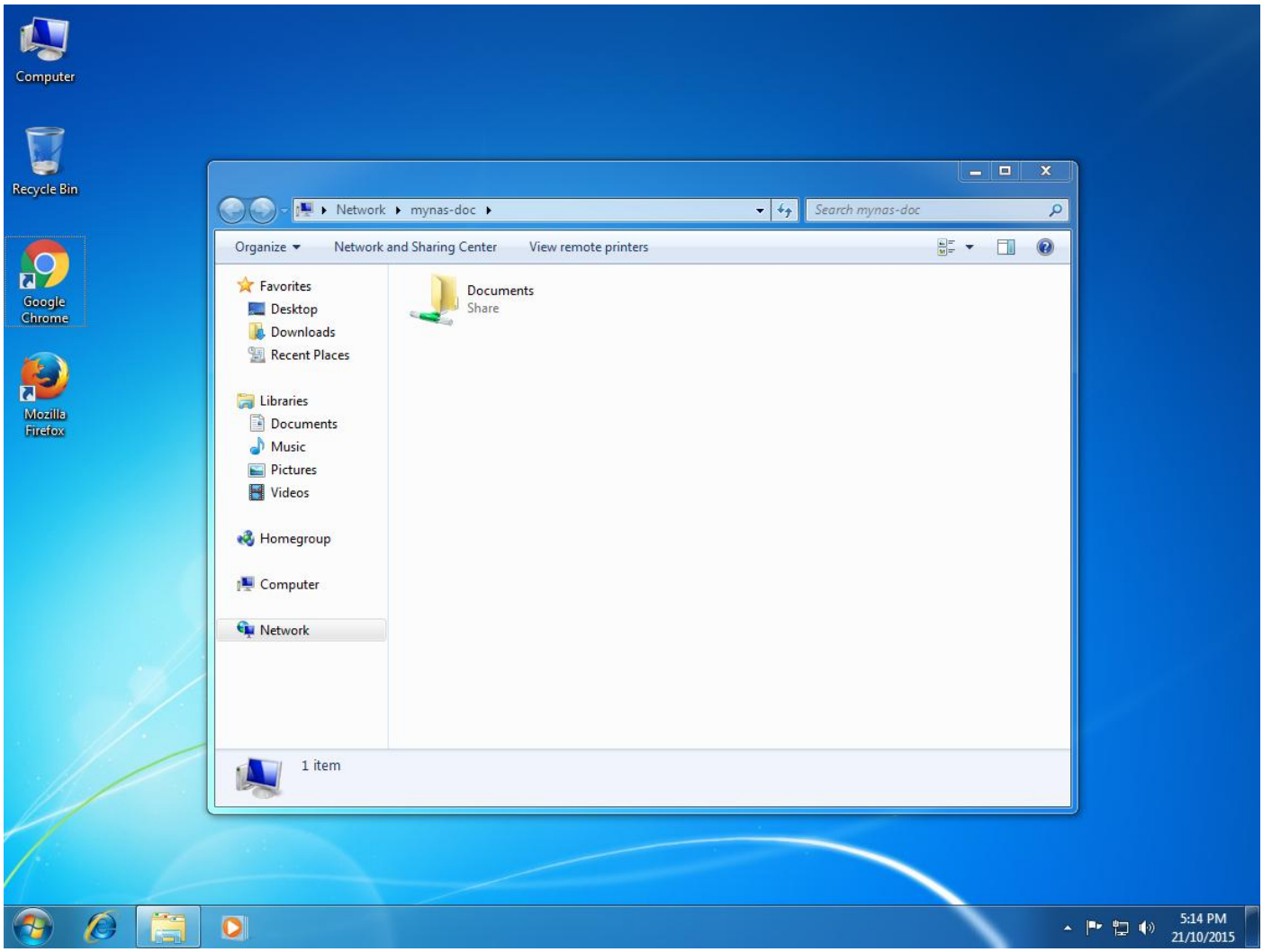


Data Share Icon Descriptions

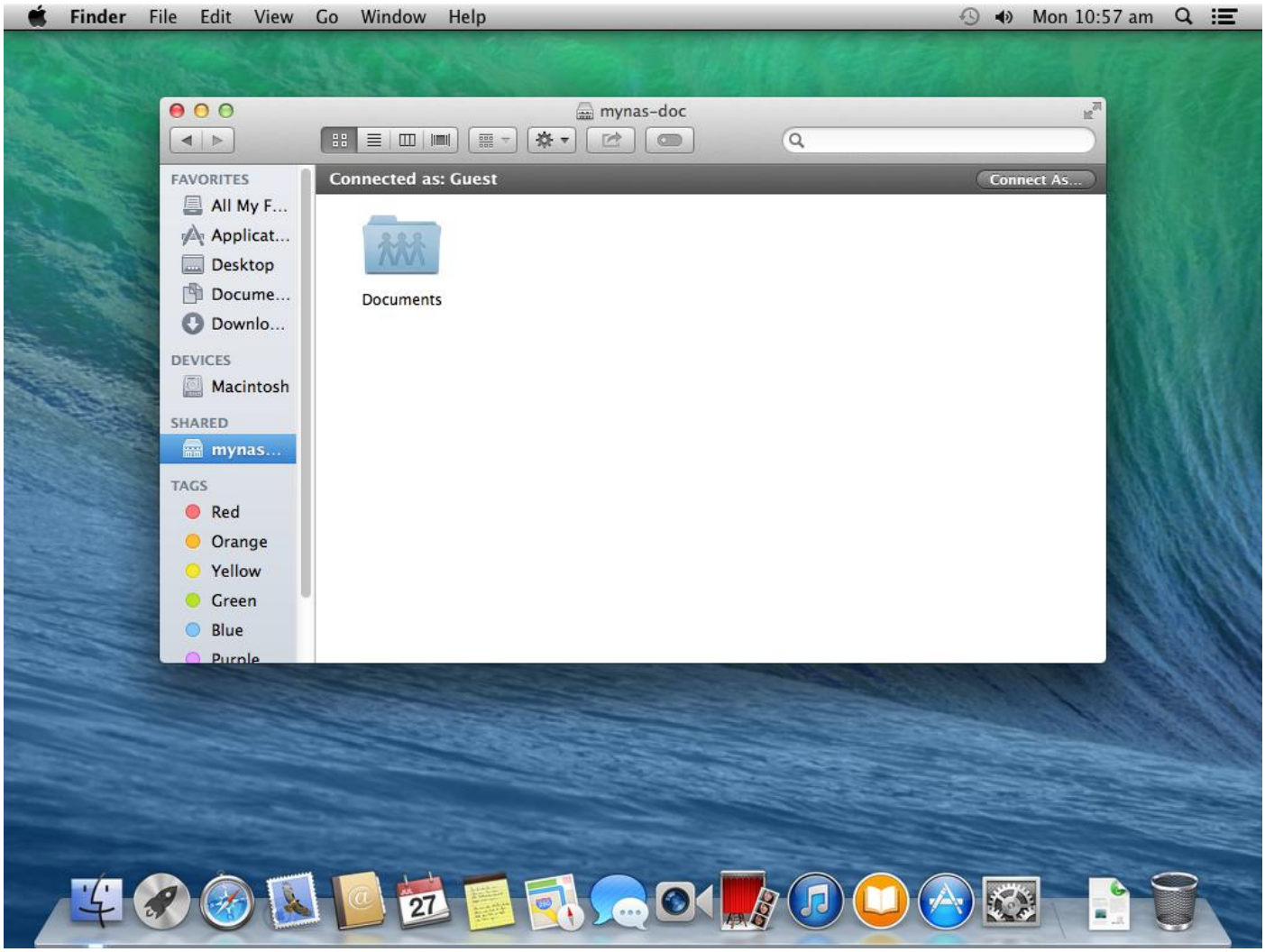
Data Share Icon	Description
	Microsoft Windows access
	Apple OS X access
	Linux / Unix access
	Data Share encryption
	Data Share importance
	Data Share access via DLNA services
	Data Share snapshots
	Local ownCloud Server access
	Cloud Replication access
	Space used by Data Share

From a Windows, Apple OSX or Linux system, the Data Share will be available as illustrated below:

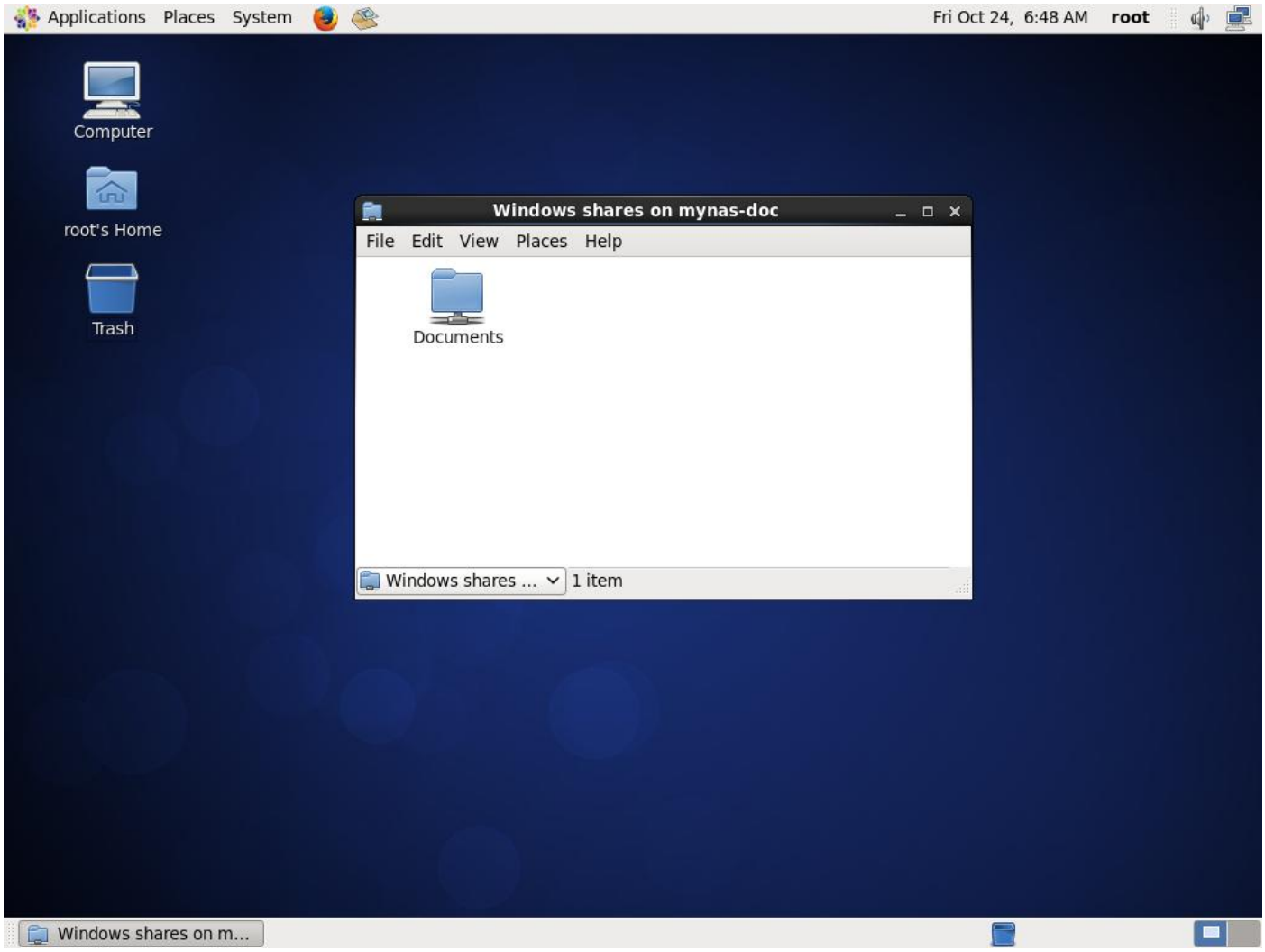
Windows



Apple OS X


Finder File Edit View Go Window Help
Mon 10:57 am
mynas-doc
FAVORITES
All My F...
Applicat...
Desktop
Docume...
Downlo...
DEVICES
Macintosh
SHARED
mynas...
TAGS
Red
Orange
Yellow
Green
Blue
Purple
Connected as: Guest
Connect As...
Documents

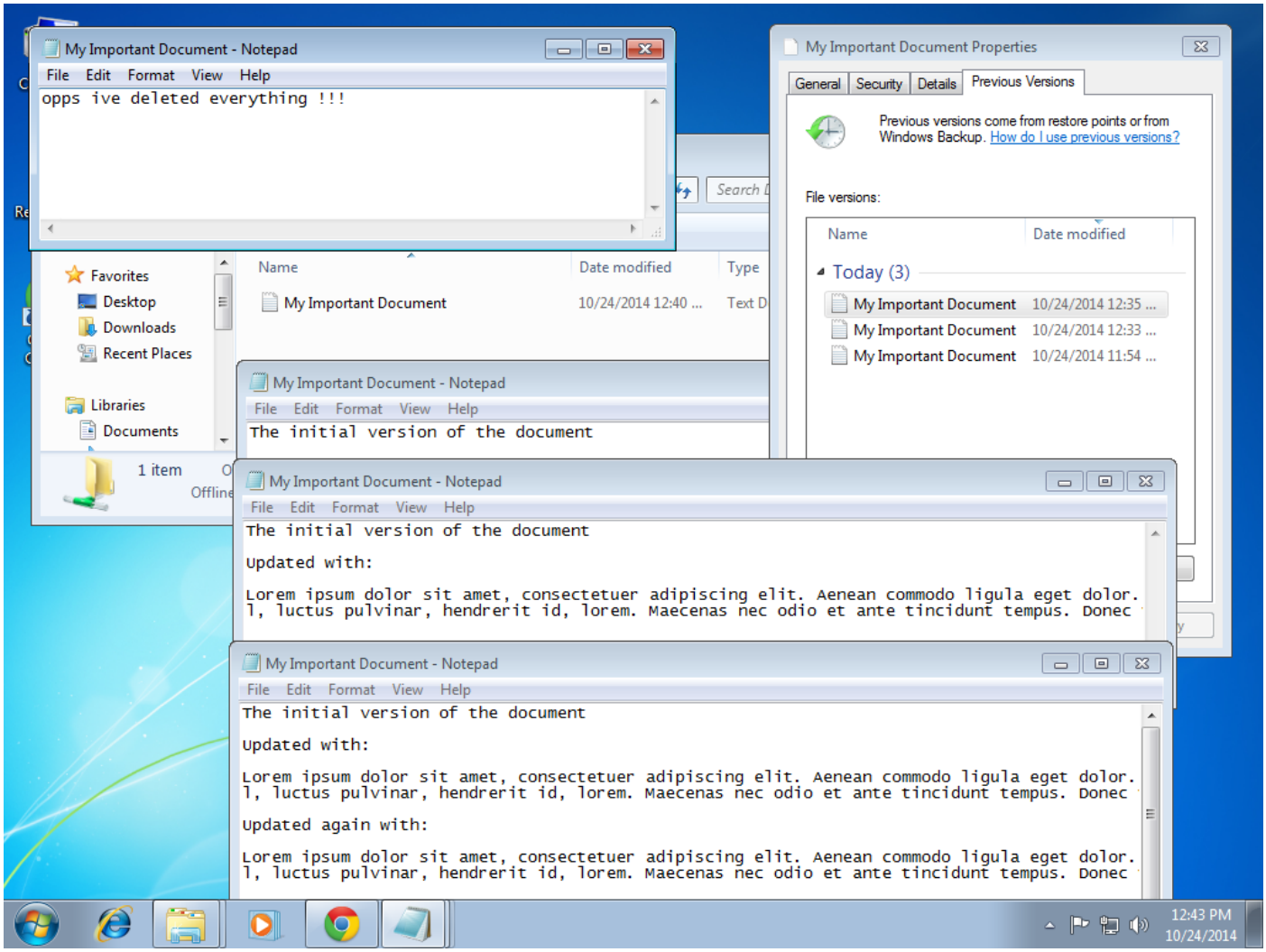
Linux


Applications
Places
System
Fri Oct 24, 6:48 AM
root
Computer
root's Home
Trash
Windows shares on mynas-doc
File
Edit
View
Places
Help
Documents
Windows shares ...
1 item
Windows shares on m...

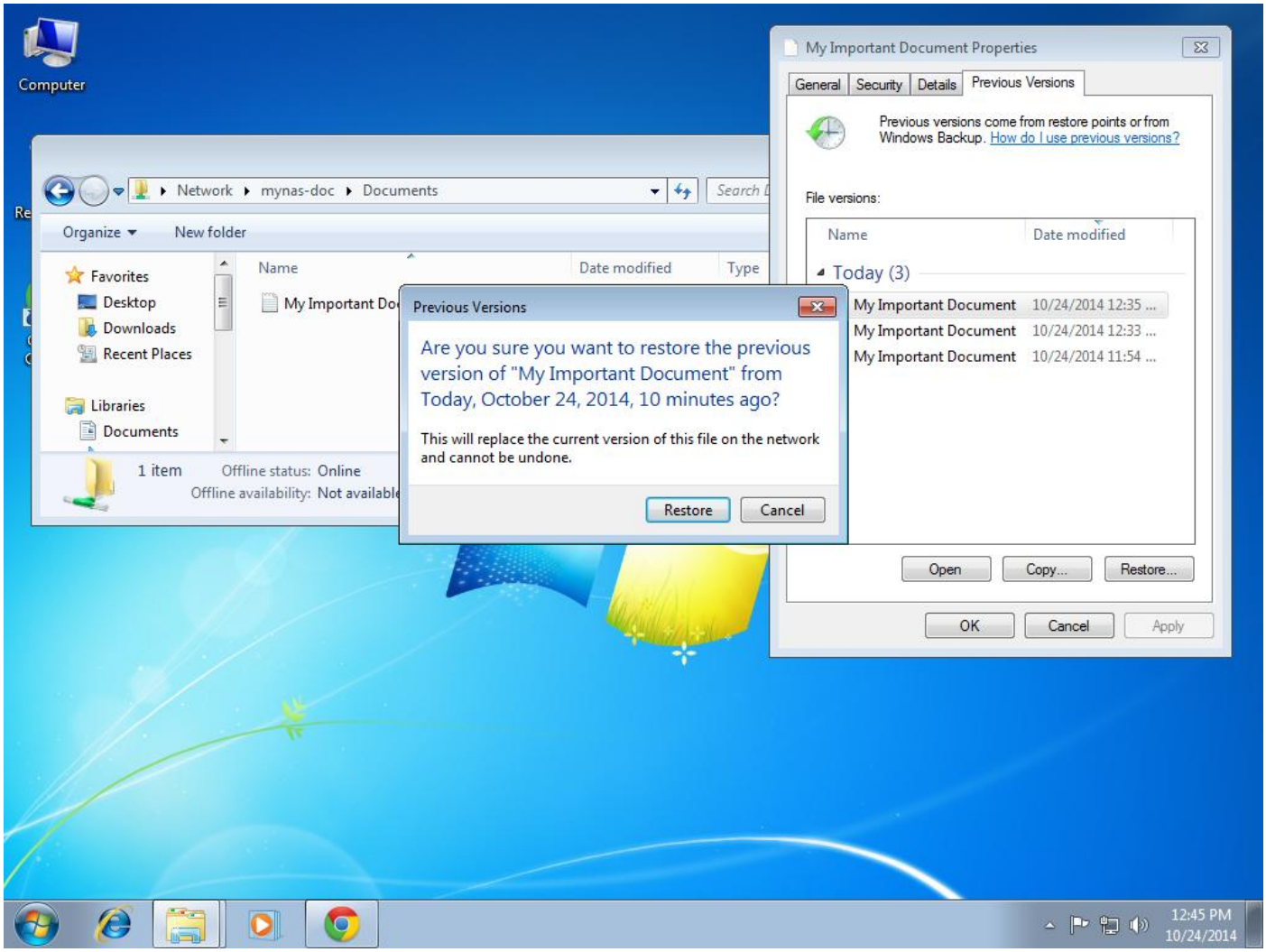
Using the Windows Previous Versions Functionality

If a particular Data Share is configured with snapshot capability, it will be possible to utilise the Windows Previous Versions.

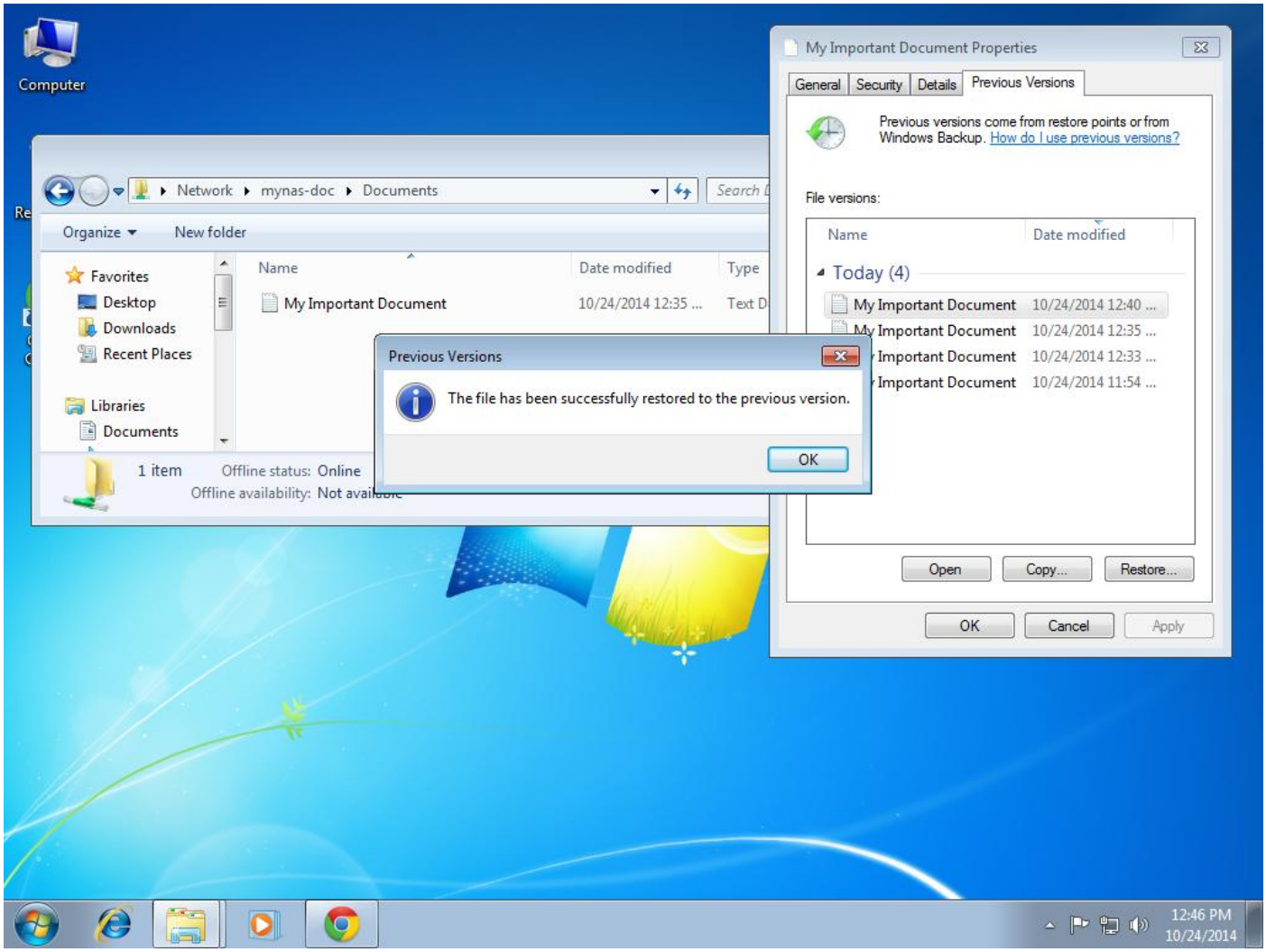
Once a snapshot has been created for a particular Data Share, and the particular file in question gets updated, the Windows Previous Version can be accessed by right-clicking on the file to display the document properties. On the tab's select the 'Previous Versions' to display any previous version that are available for that file as illustrated below:



To access to previous version, simply double-click on the file in question. Once the right file is identified, click on the Restore button to restore the selected file:



Click Restore and the file will now be restored from the snapshotted data.



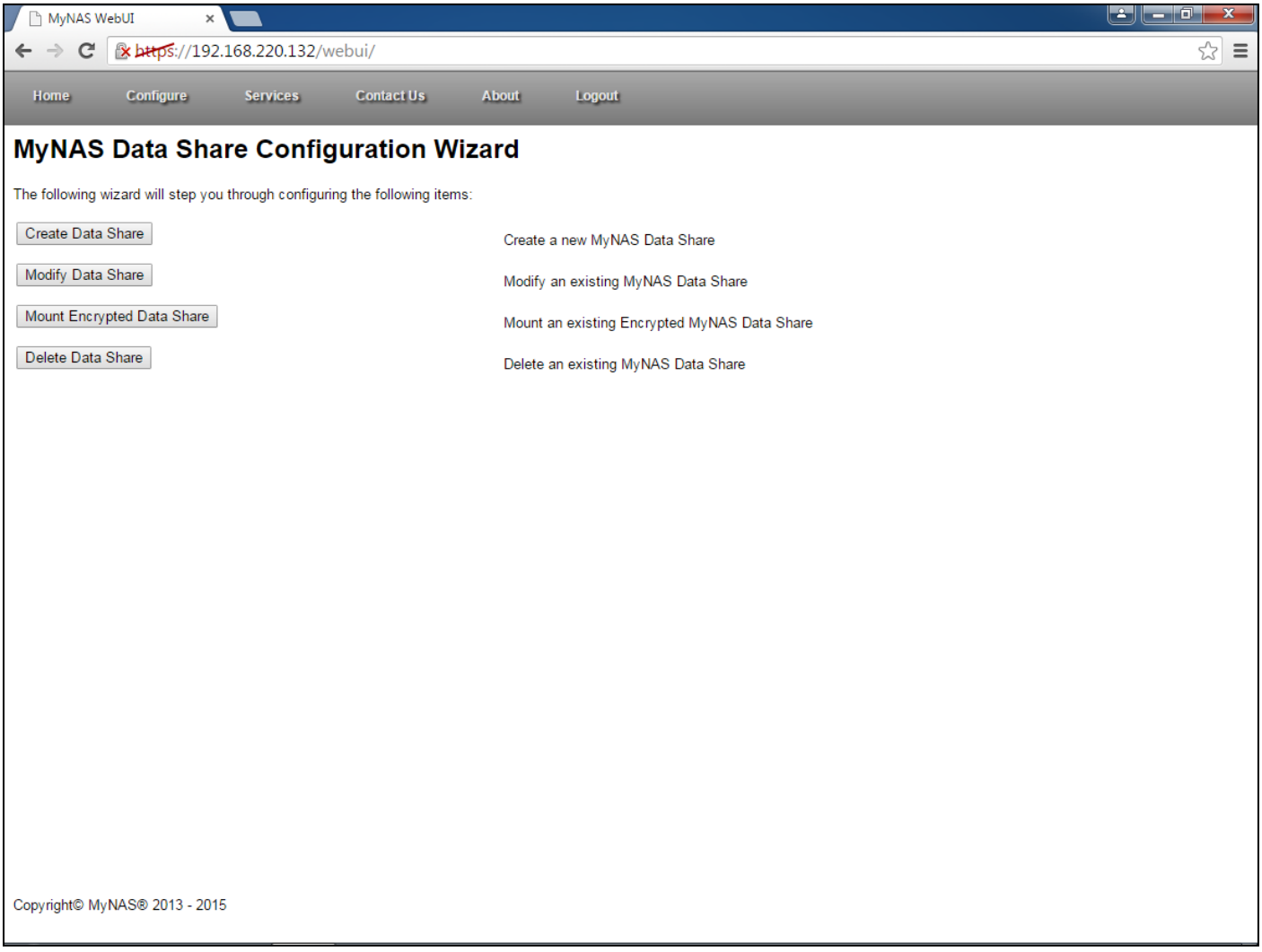
Click OK to complete the restore operation.

Remounting an Encrypted Data Share

If you configure a data share to be encrypted, and your MyNAS storage appliance is restarted, the encrypted data share will need to be remounted manually.

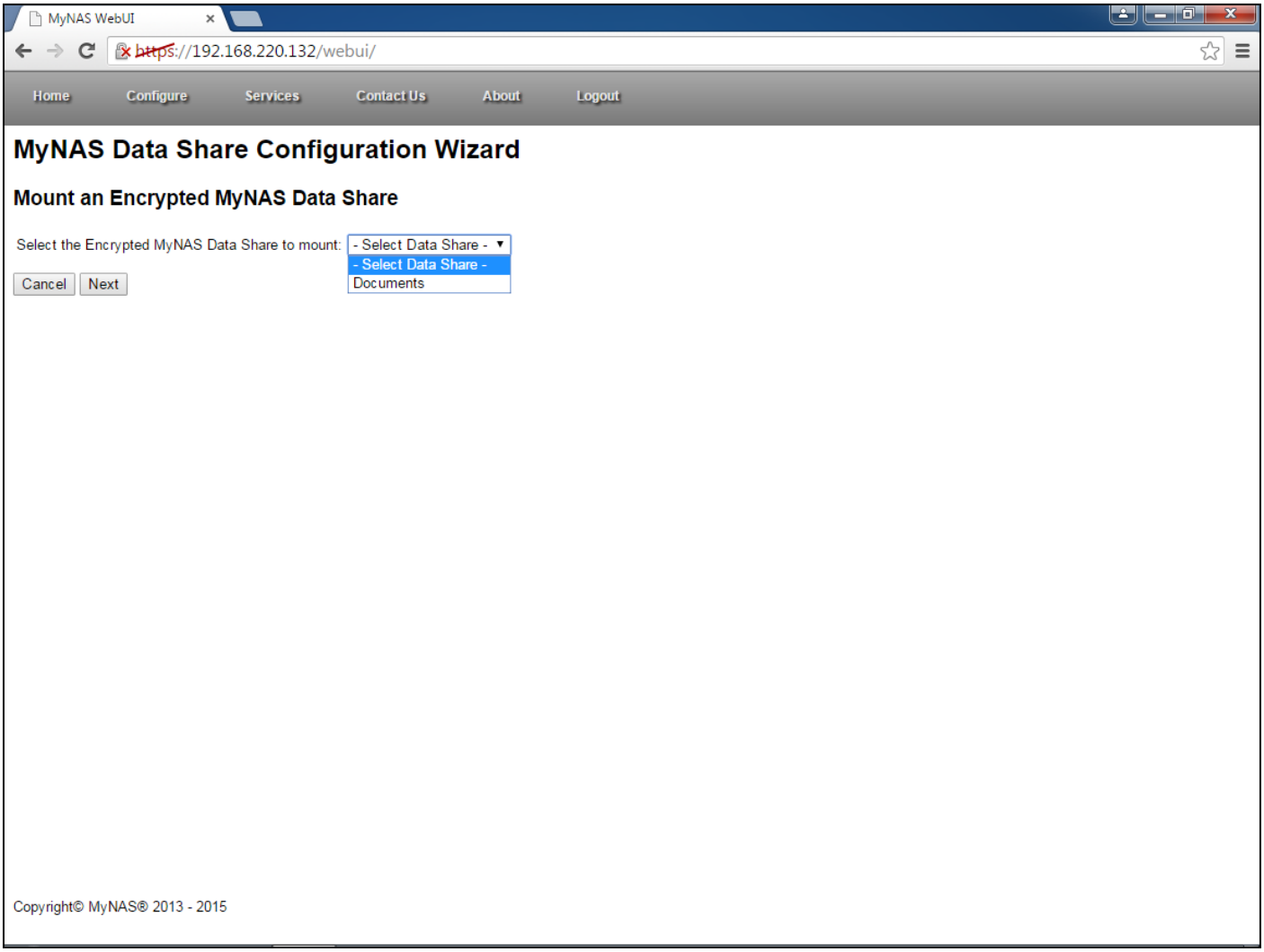
Use the directions below to update the Data Share as required.

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Data Shares'. Once selected, the following will be displayed:



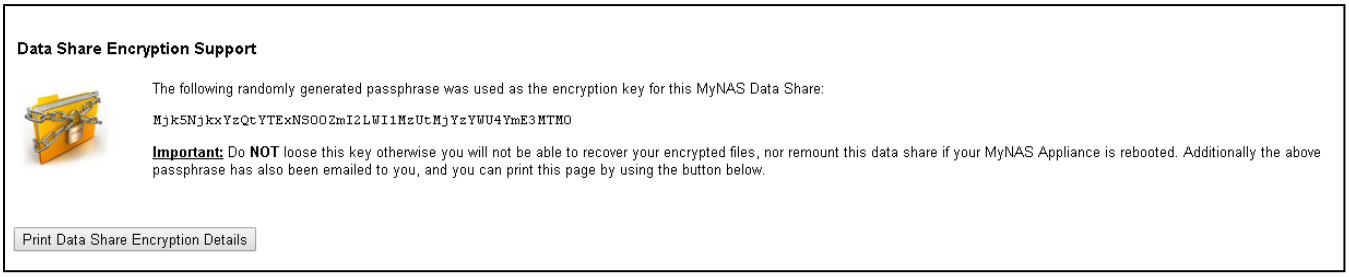
To remount an encrypted data share, click the 'Mount Encrypted Data Share' button

From the drop down menu, select the encrypted data share to remount:



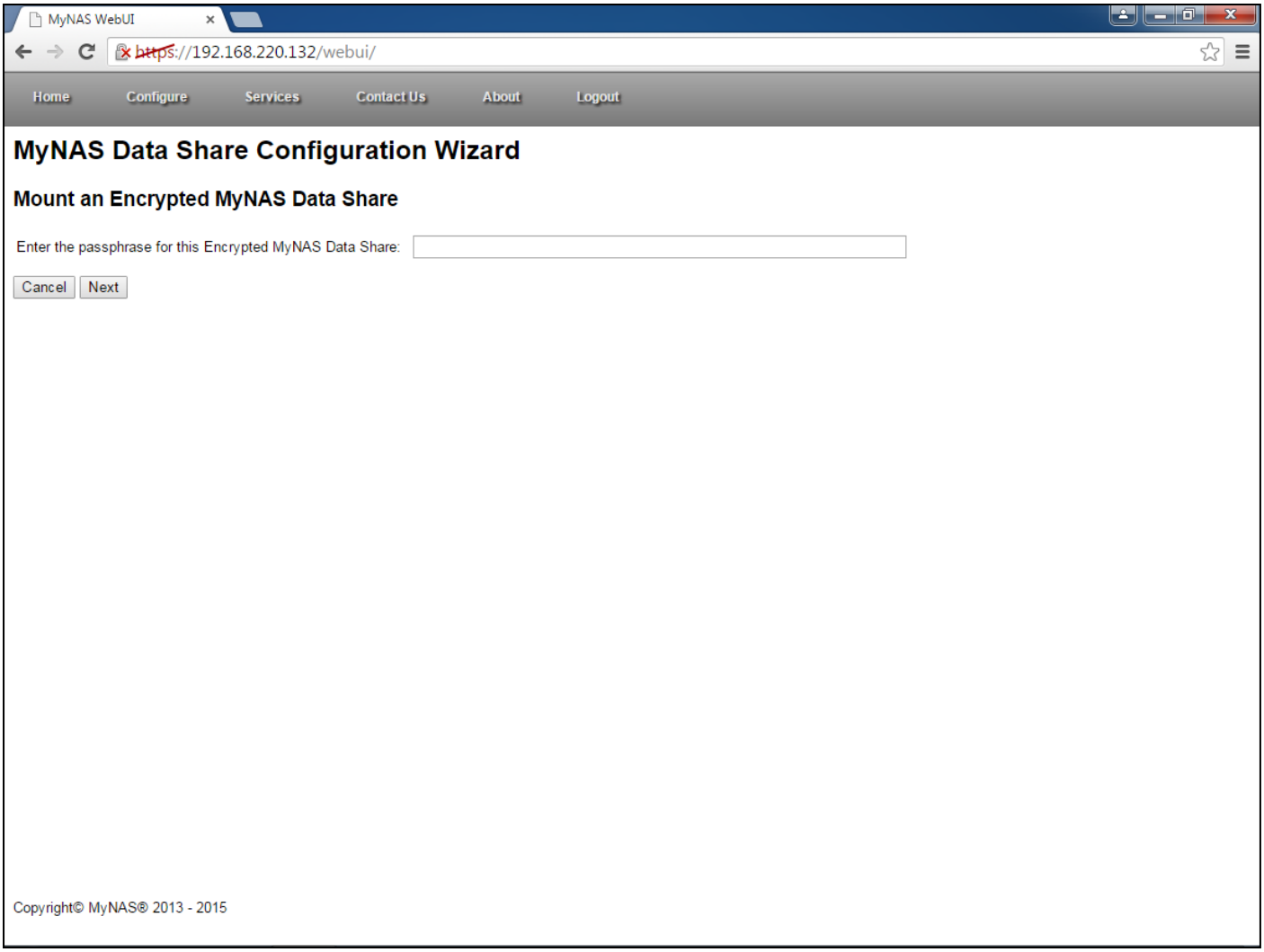
Once the correct data share is selected, click next

Type in the data share encryption passphrase to remount the data share. The encryption passphrase is provided when the data share is created as illustrated below:



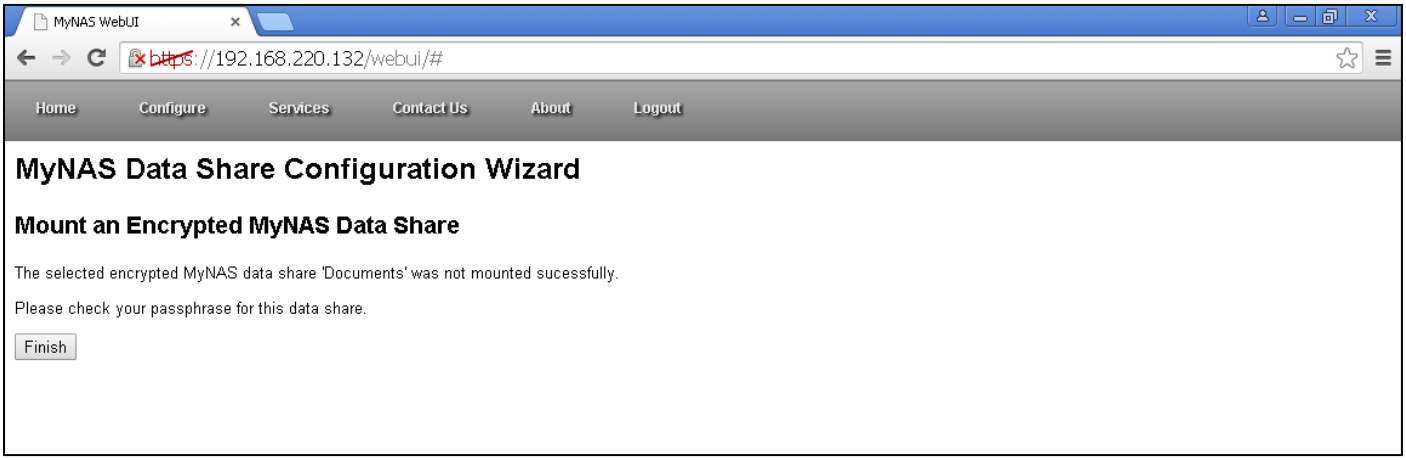
Note: If you do not have the passphrase for the data share, any encrypted data is **unrecoverable.**

Once you have this data share's encryption passphrase, enter the passphrase to remount the data share:

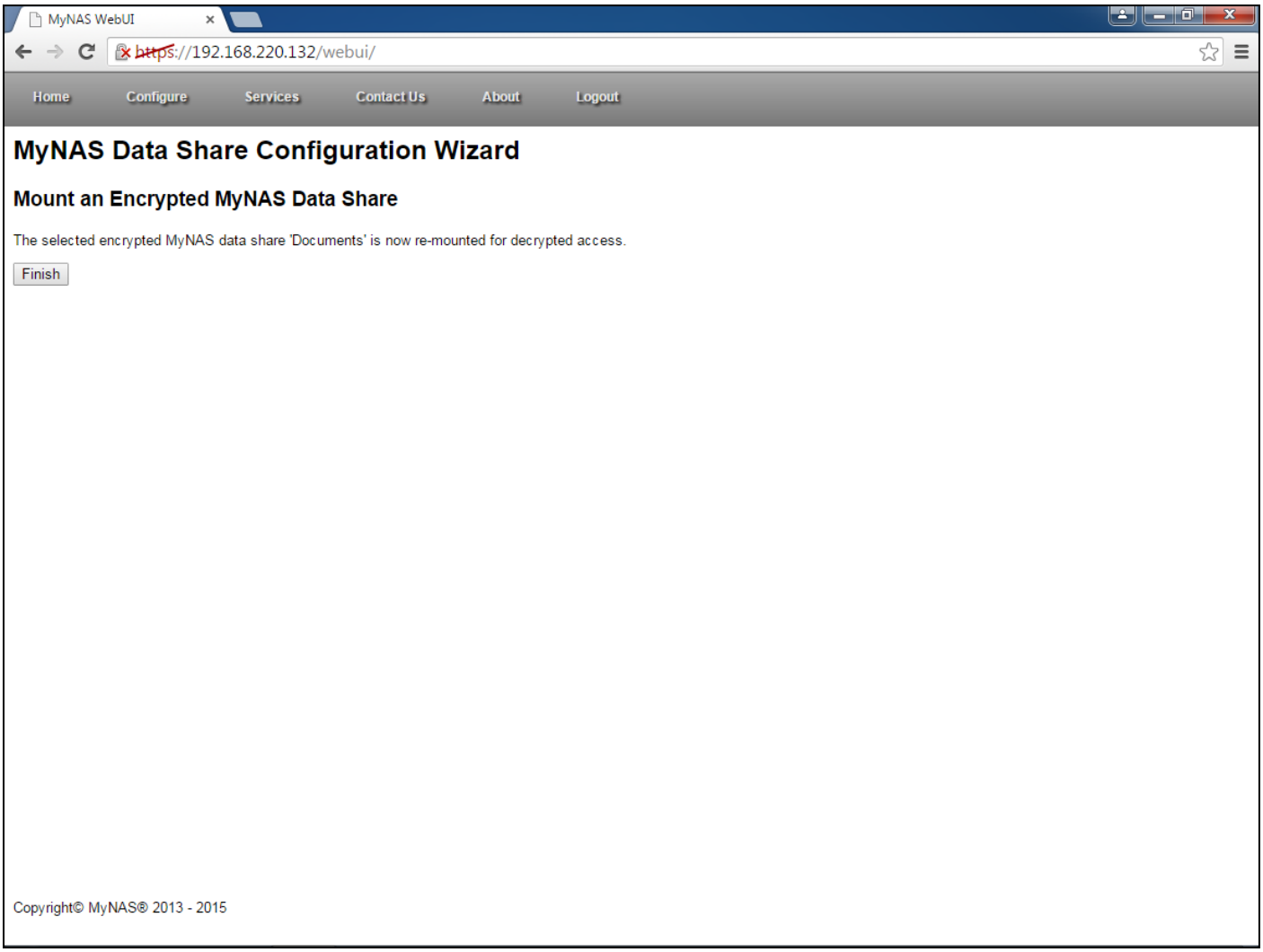


Click 'Next' to continue

If there is an issue with the passphrase, the following error message will be displayed:



If the passphrase is correct, the data share will be mounted successfully:



Modify a Data Share

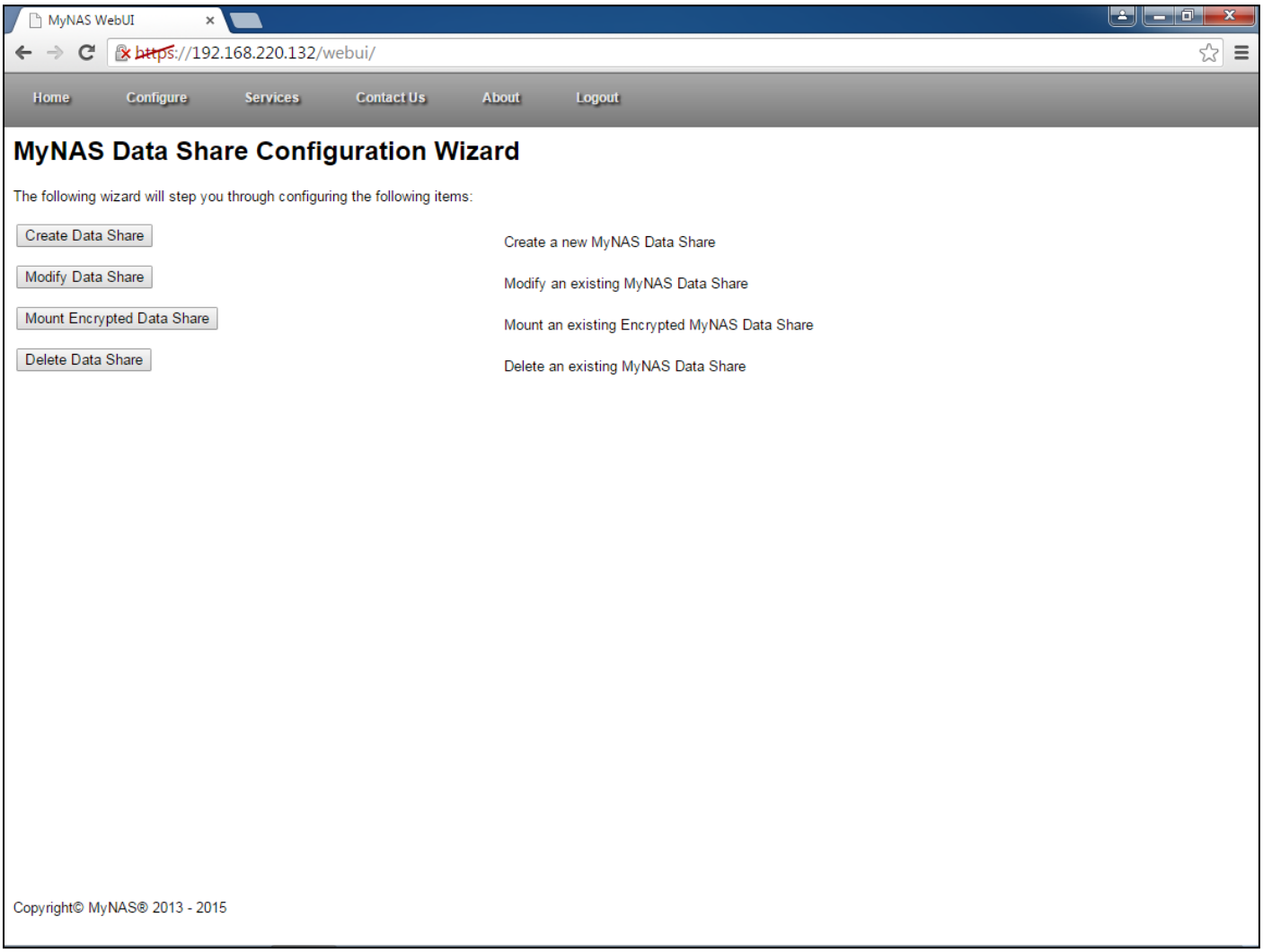
Modifying a Data Share allows the following to occur:

- Rename a Data Share to a new name including updating the share comment
- Updating the Data Share access mechanism (Windows, Apple OS X or Linux/Unix)
- Updating the access privileges for the share
- Updating the Time Machine Support
- Updating the Data Share importance
- Updating the DNLA access for the data share
- Updating the snapshot requirement for the data share

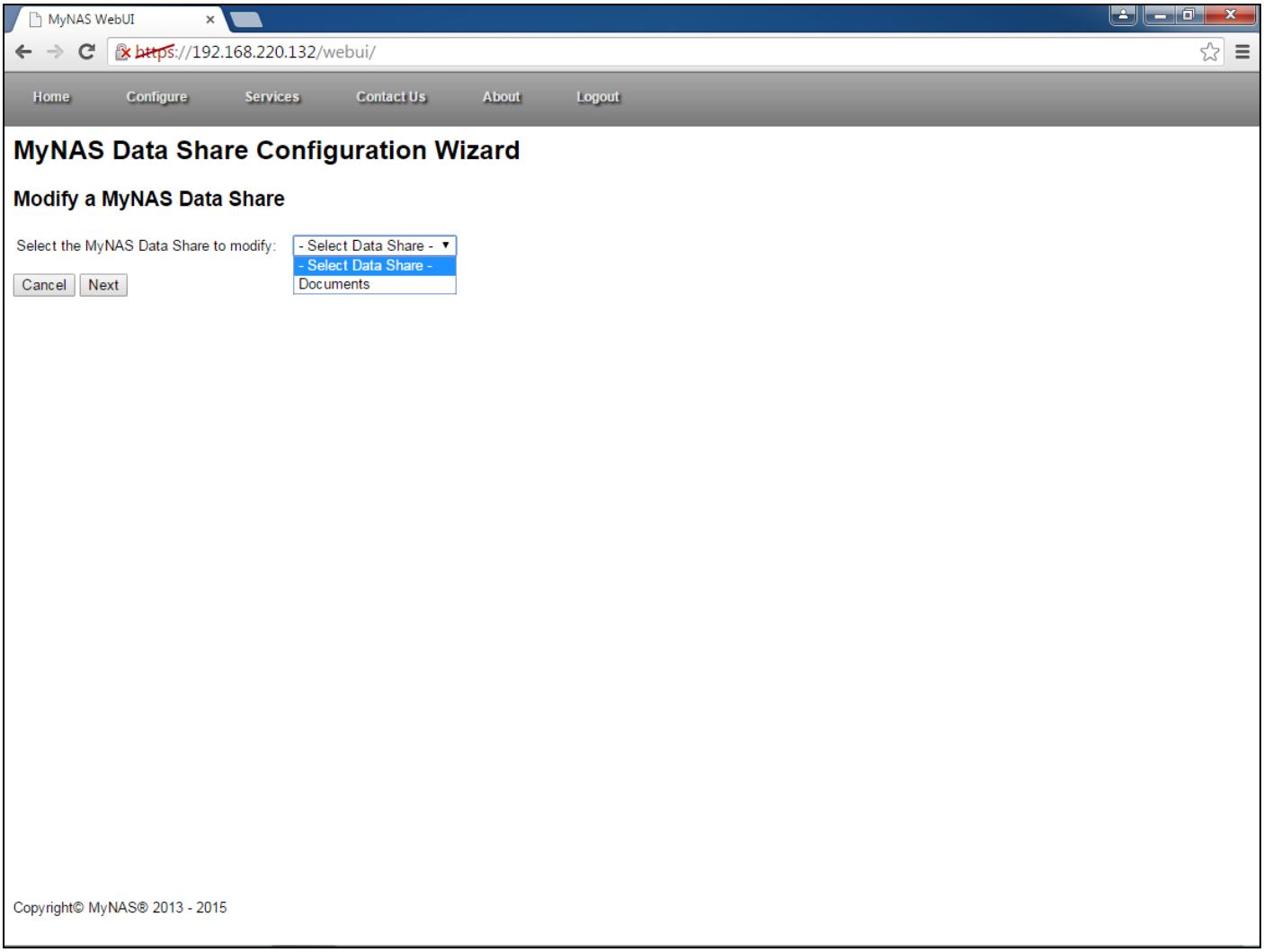
Note: Data encryption support can only be configured when creating a new Data Share. It cannot be enabled / disabled using the modify data share process due to the creation of random passphrases and supporting any already encrypted files within that data share.

Use the directions below to update the Data Share as required.

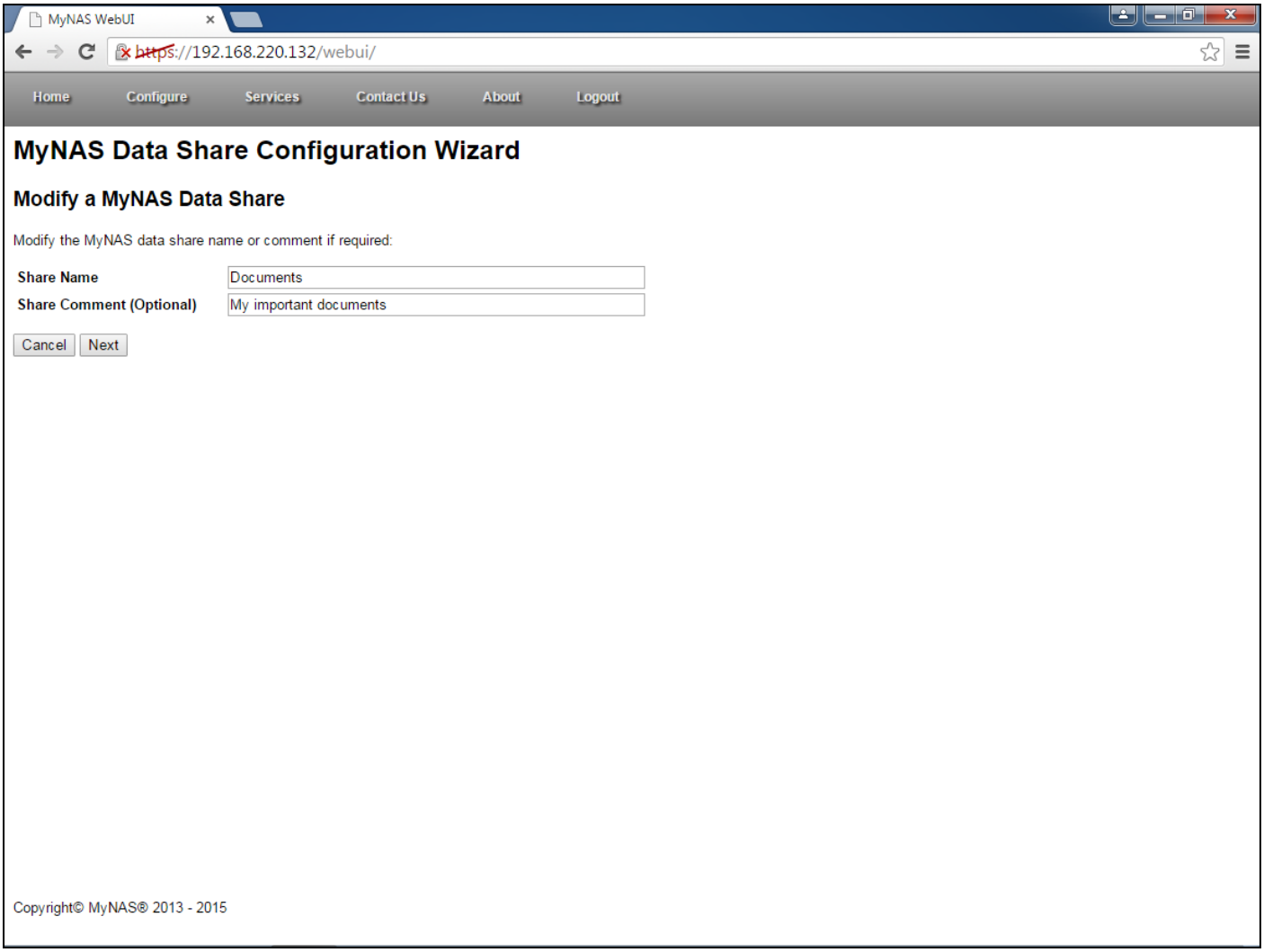
Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Data Shares'. Once selected, the following will be displayed:



To modify a Data Share, click the Modify Data Share button.

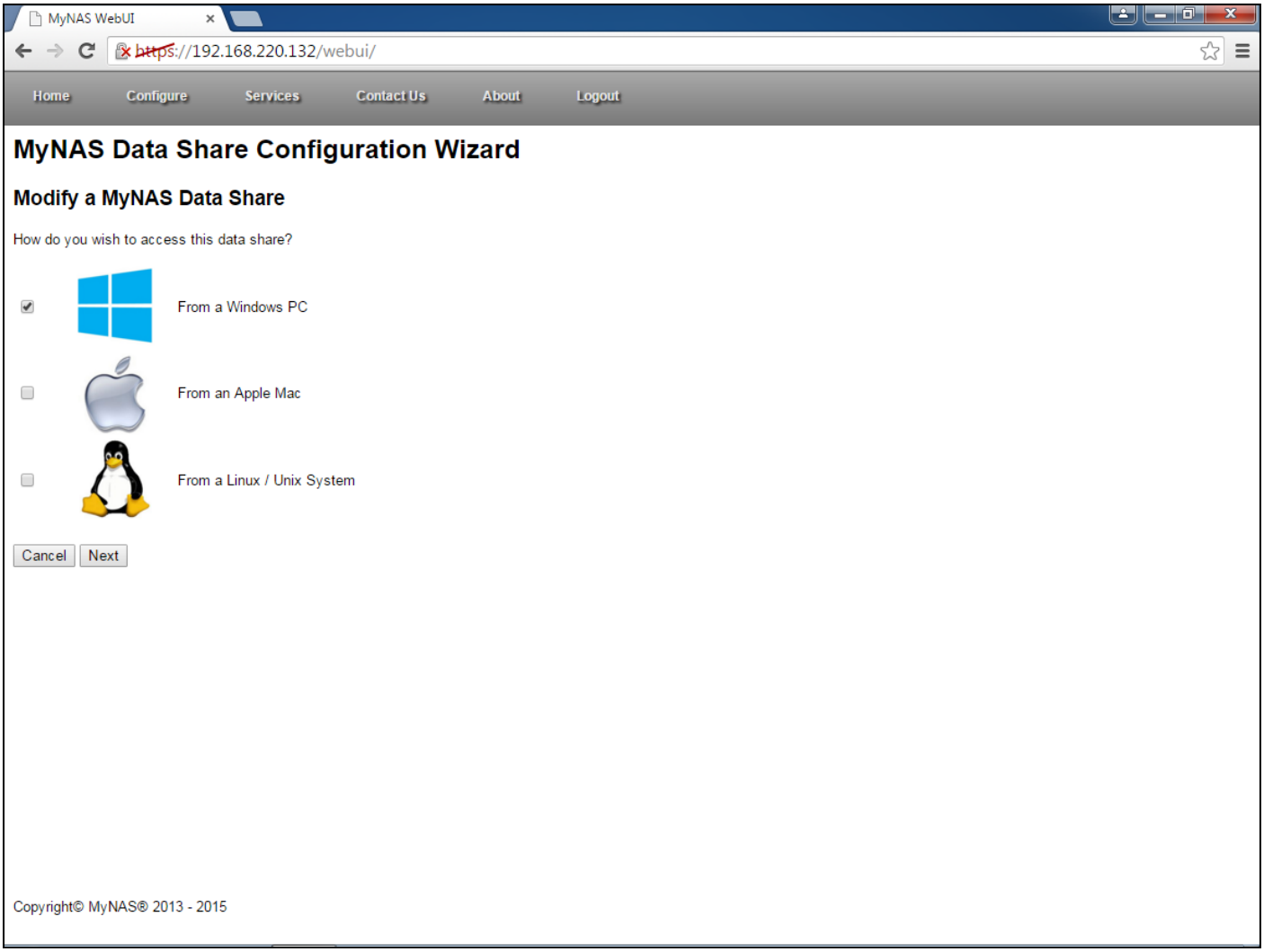


Select the Data Share to modify and click 'Next'



Update the Data Share name and share comment if required. Click 'Next'

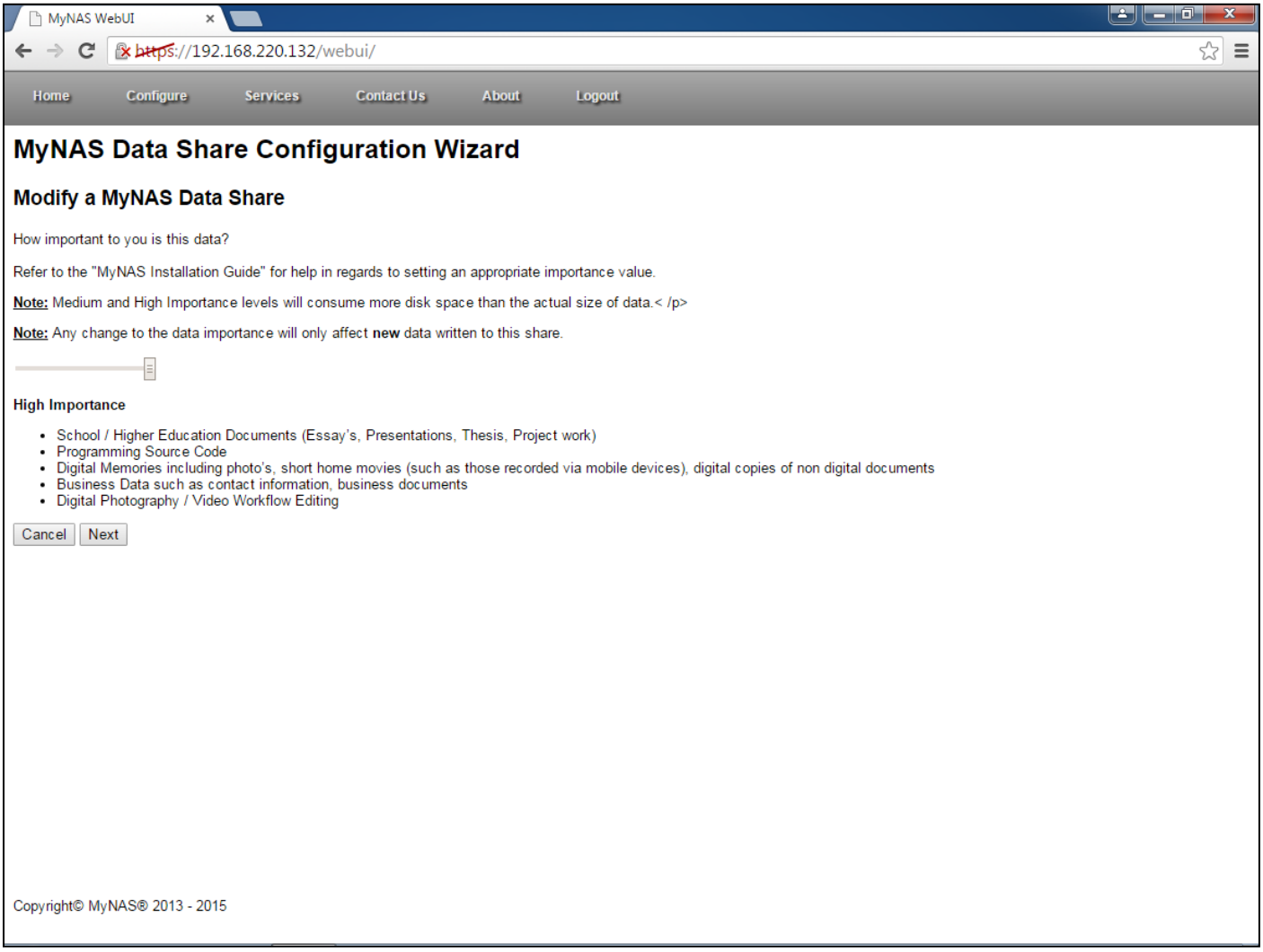
Update the Data Share access mechanism as required



Once updated, click 'Next' to continue.

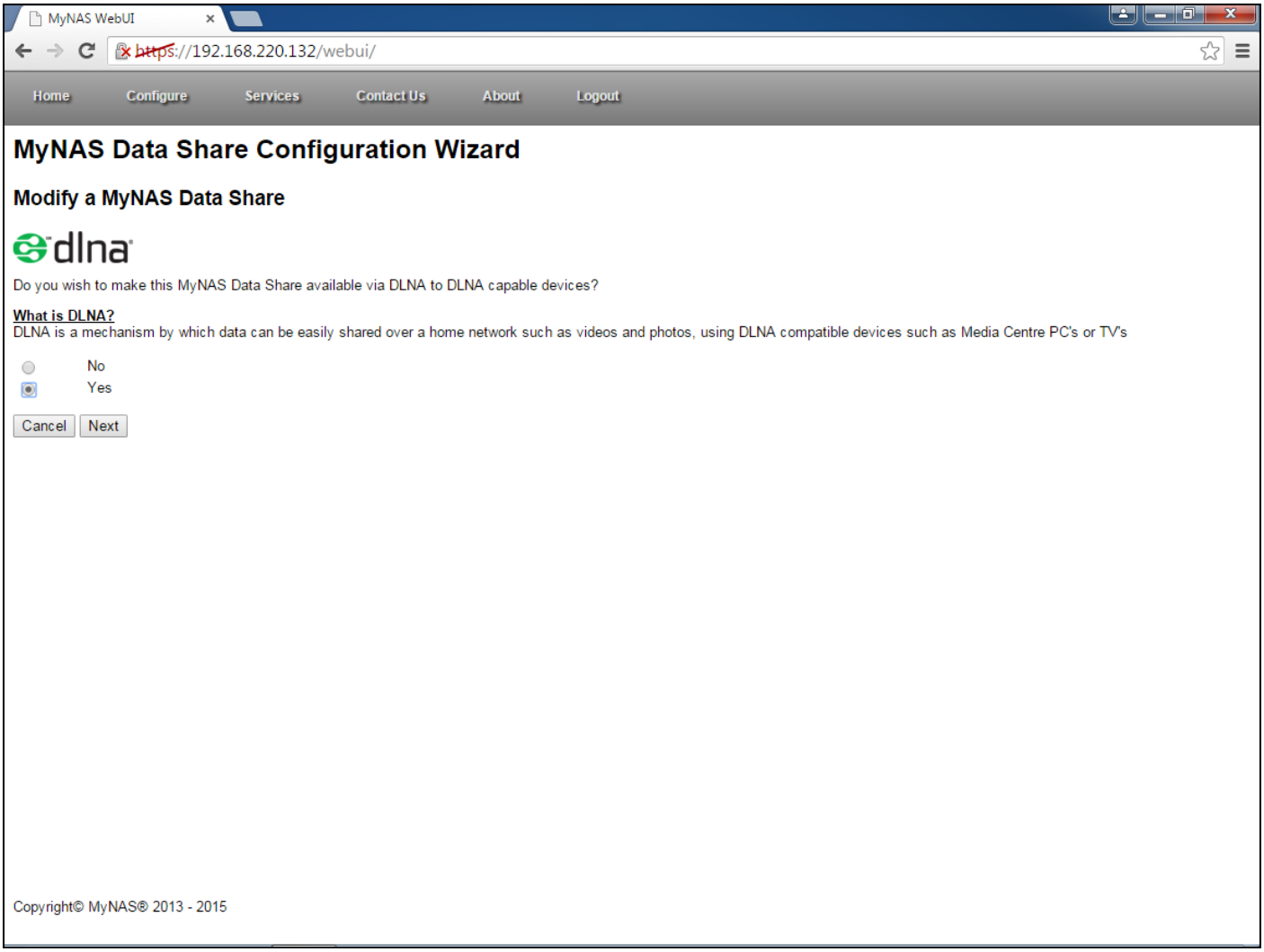
Update the Data Share importance for this Data Share.

Note: Any change to the data importance will only affect **new** data written to this data share



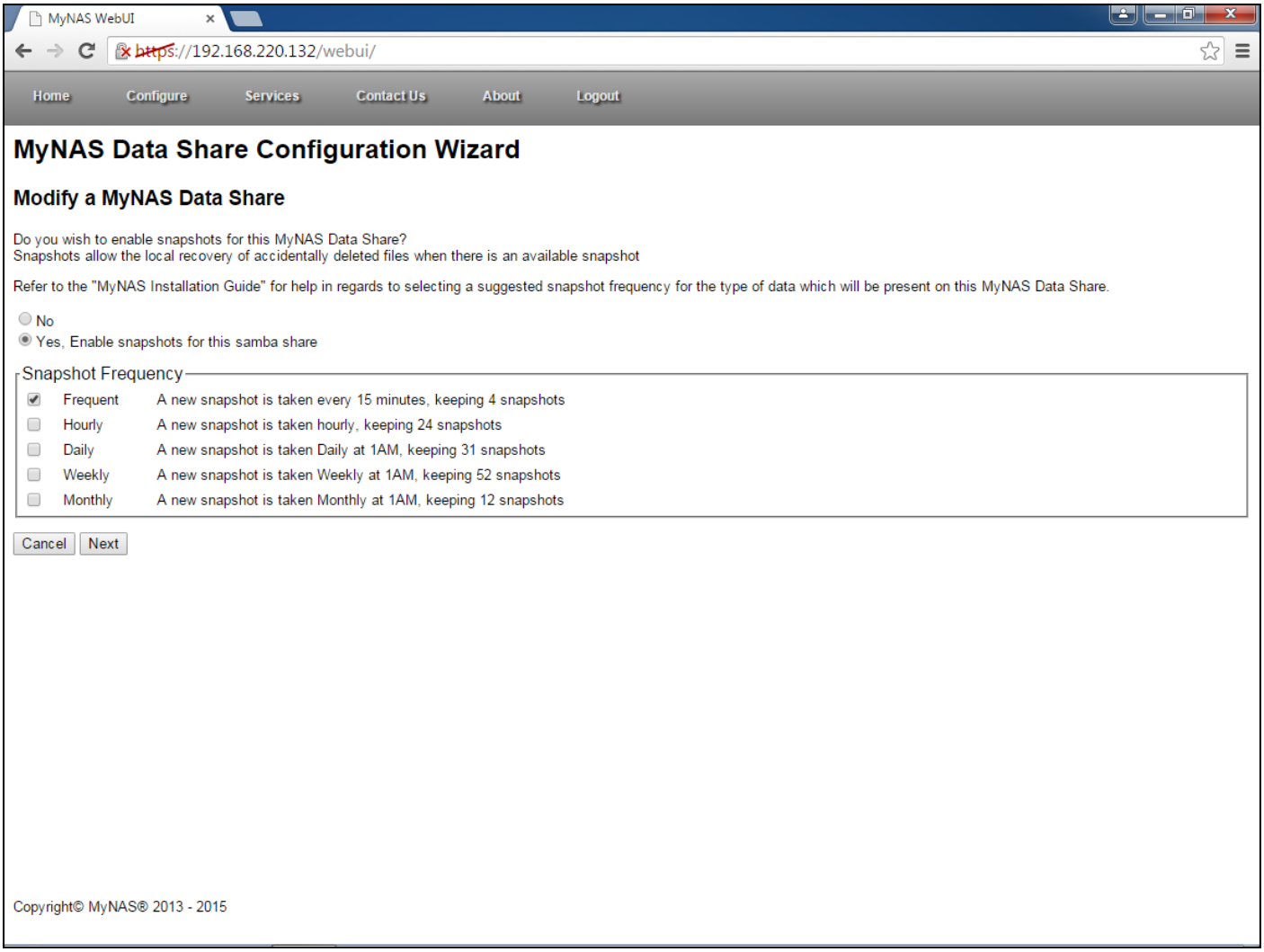
Once the Data Share importance is updated, click 'Next'

Update the DLNA setting for this Data Share



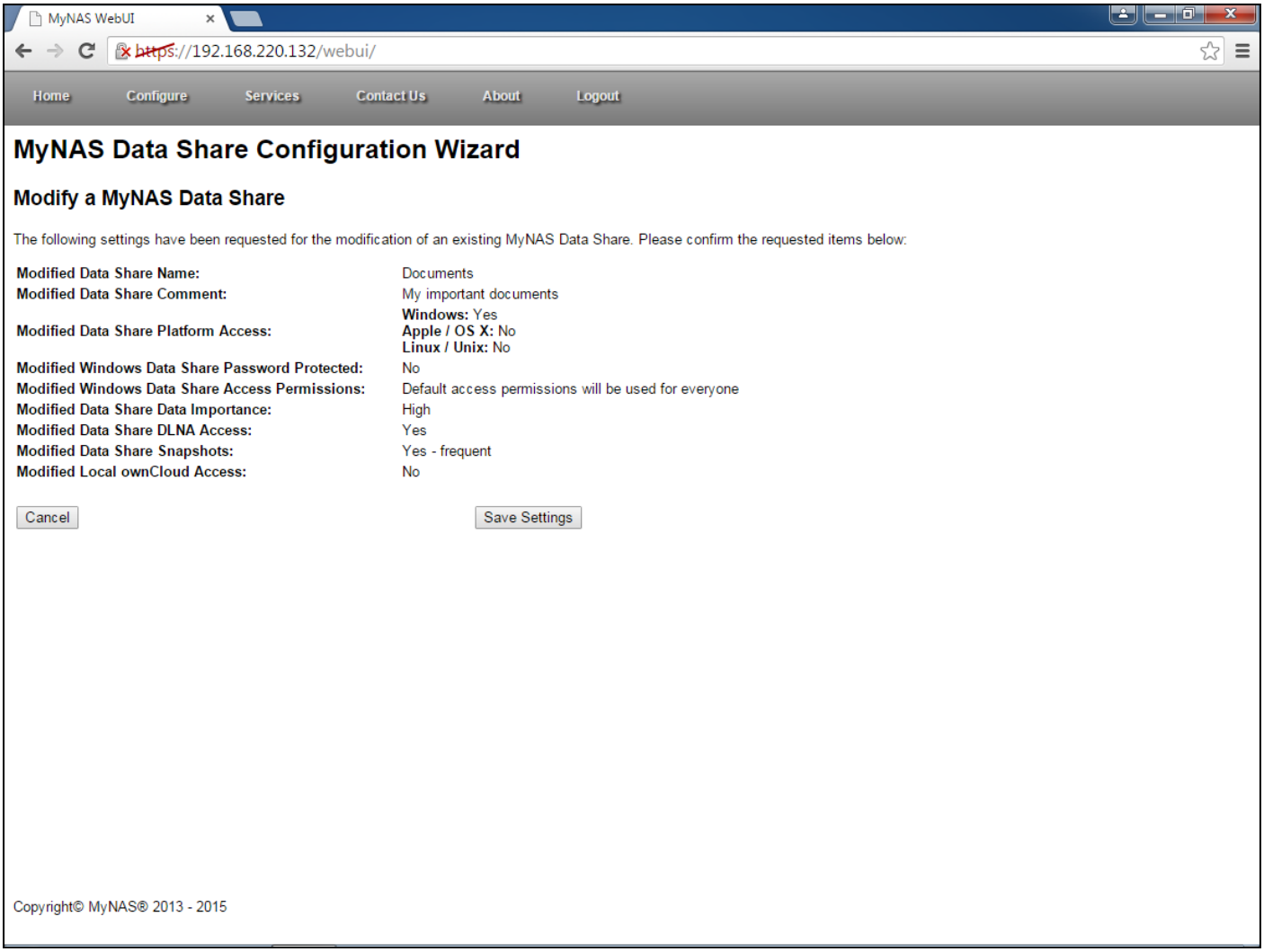
Once the Data Share DLNA support is updated, click 'Next'

Update the snapshot requirements for this Data Share:



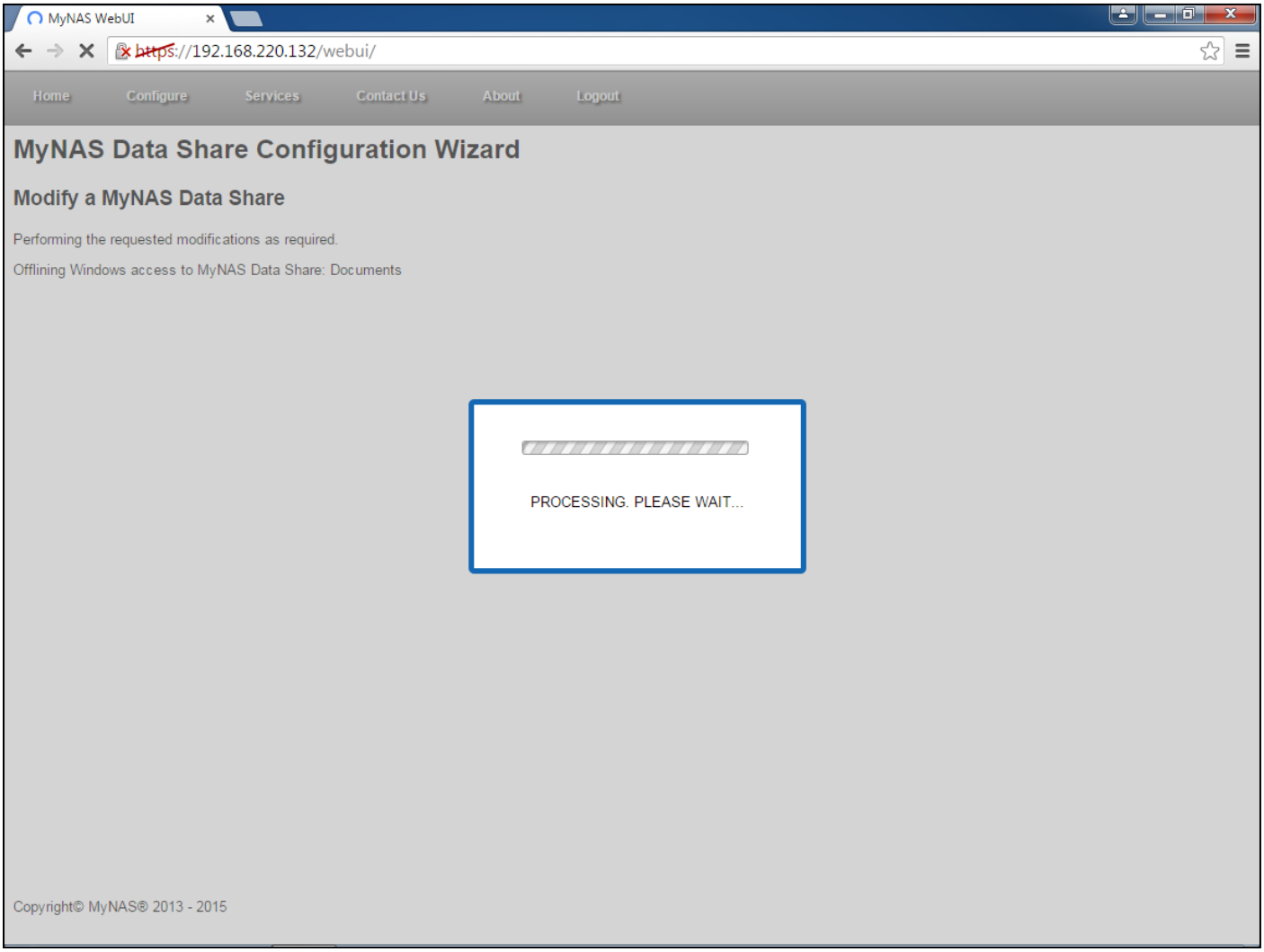
Once the Data Share snapshot requirements are updated, click 'Next'

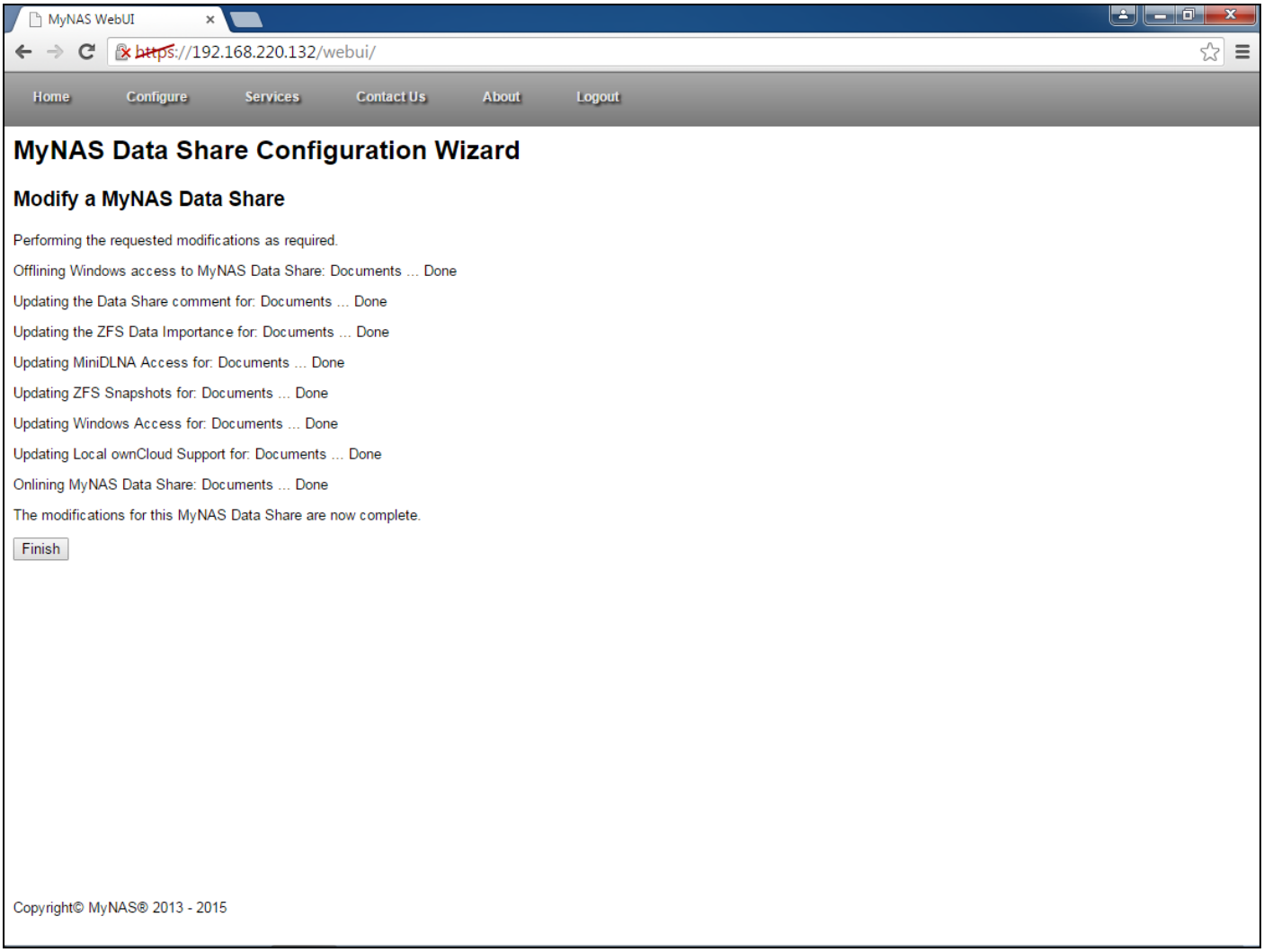
Confirm all the required changes for this Data Share:



If all changes are OK, click 'Save Settings'.

MyNAS will now process the changes are required



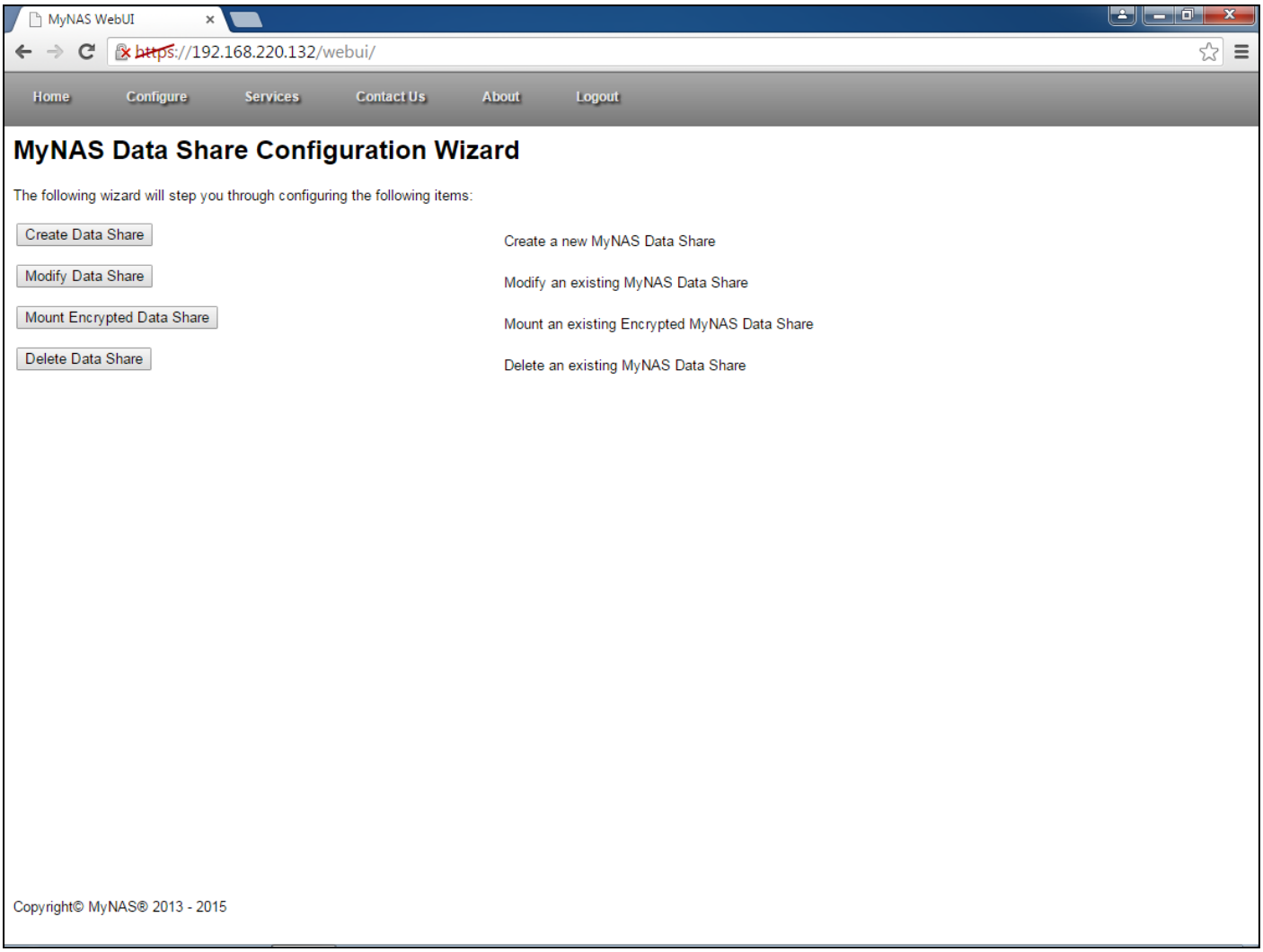


Once all the changes are complete, click 'Finish' to return the main MyNAS console.

Delete a Data Share

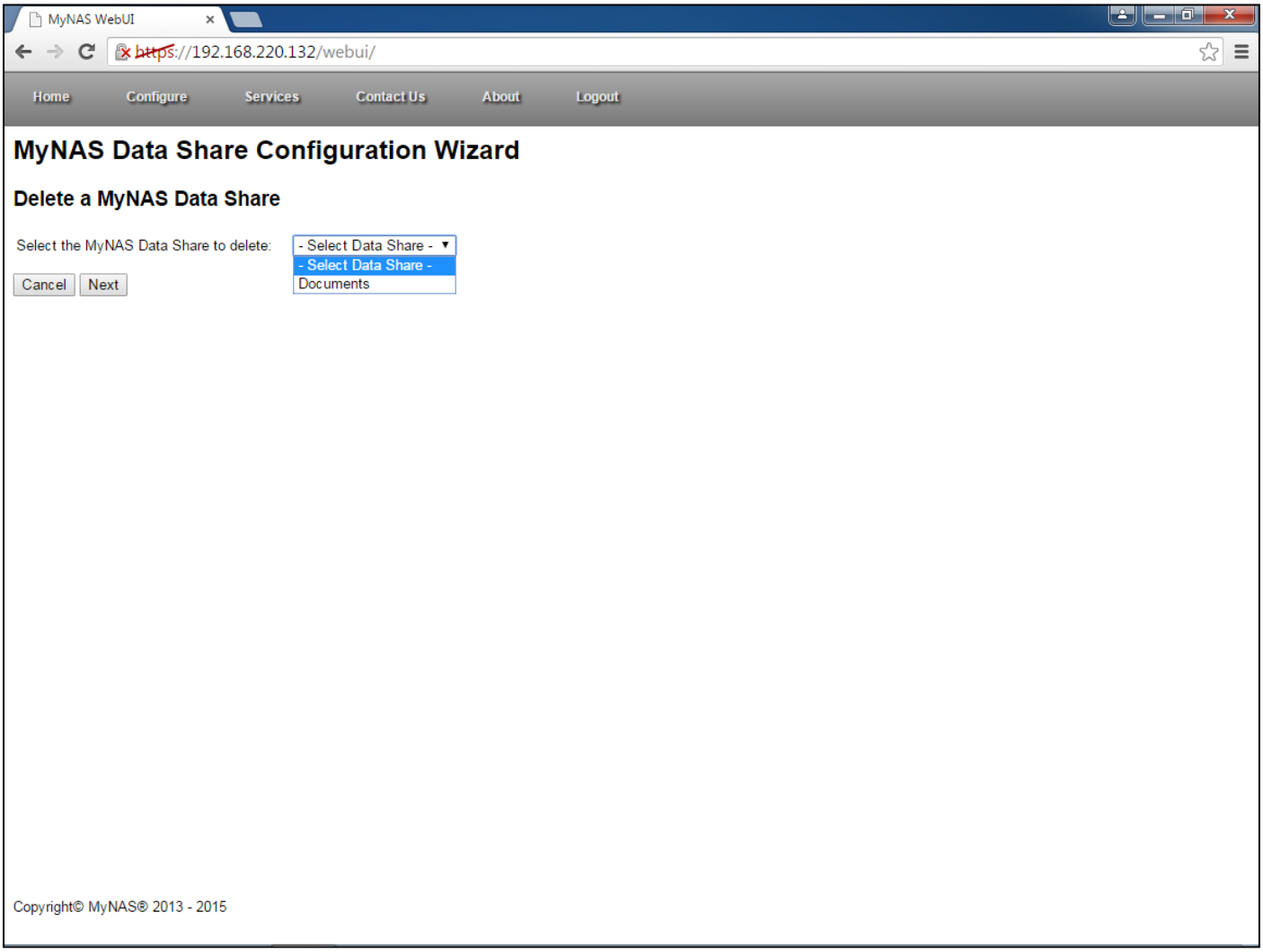
Deleting a Data Share is a destructive process for the data on that share. Follow the directions below to delete a MyNAS Data Share.

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Data Shares'. Once selected , the following will be displayed:

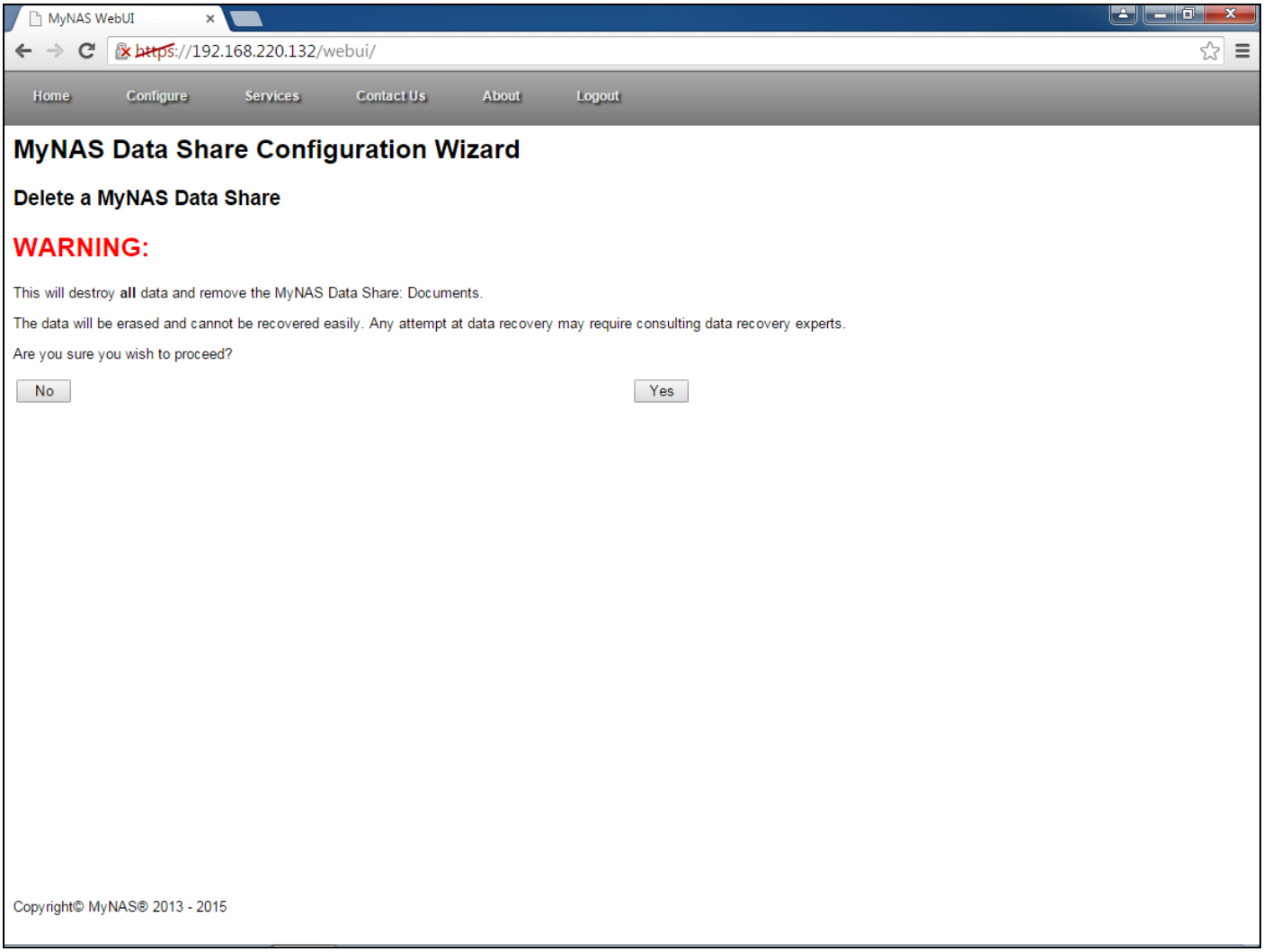


Click 'Delete Data Share' to perform the delete operation

Select the Data Share to delete and click 'Next'

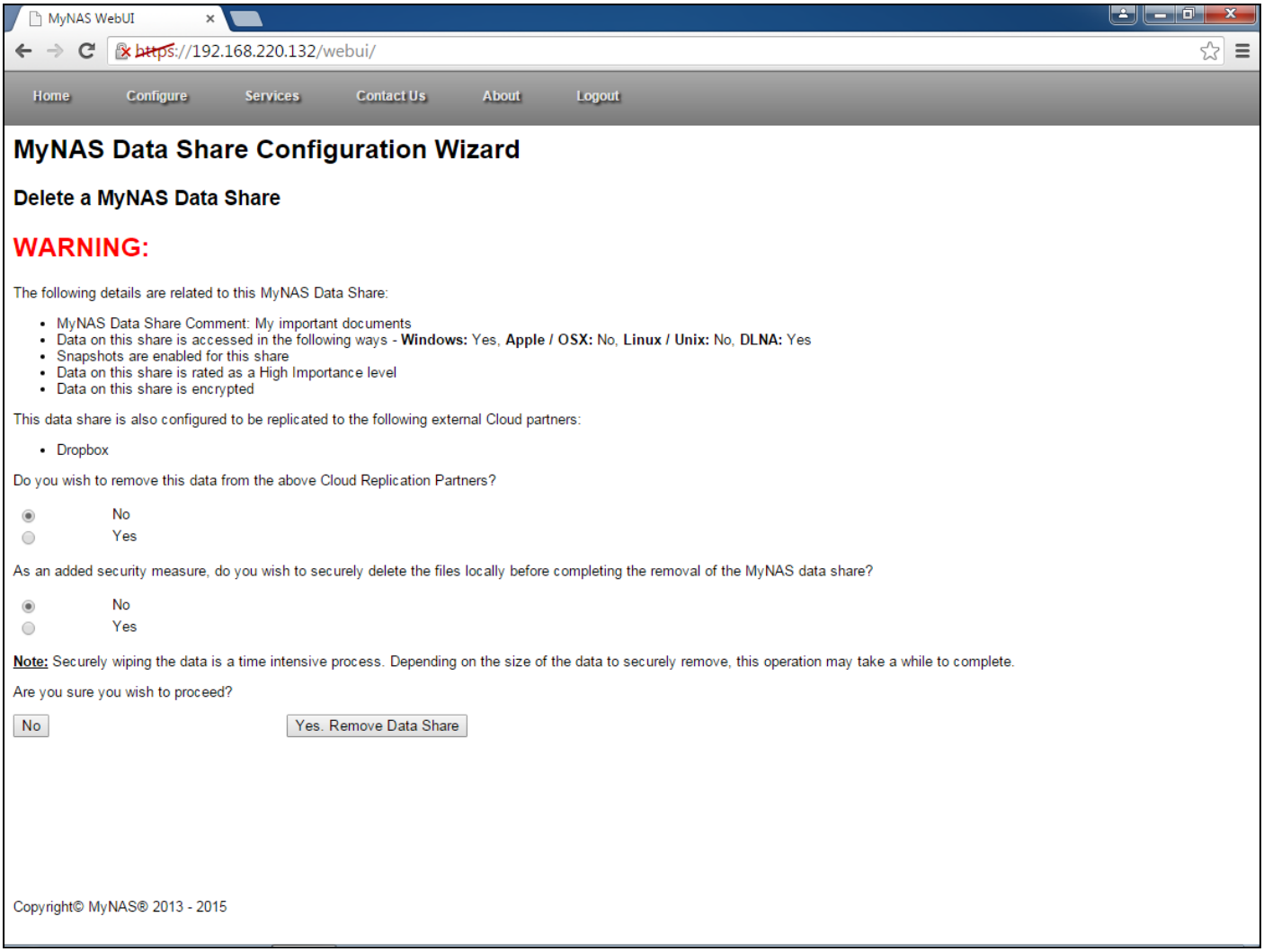


A warning will be displayed regarding the destructive nature of performing the delete of the Data Share:



If you are sure this is the Data Share to delete, click 'Yes' to continue

MyNAS will now prompt a second time regarding the removal of the Data Share as detailed below:



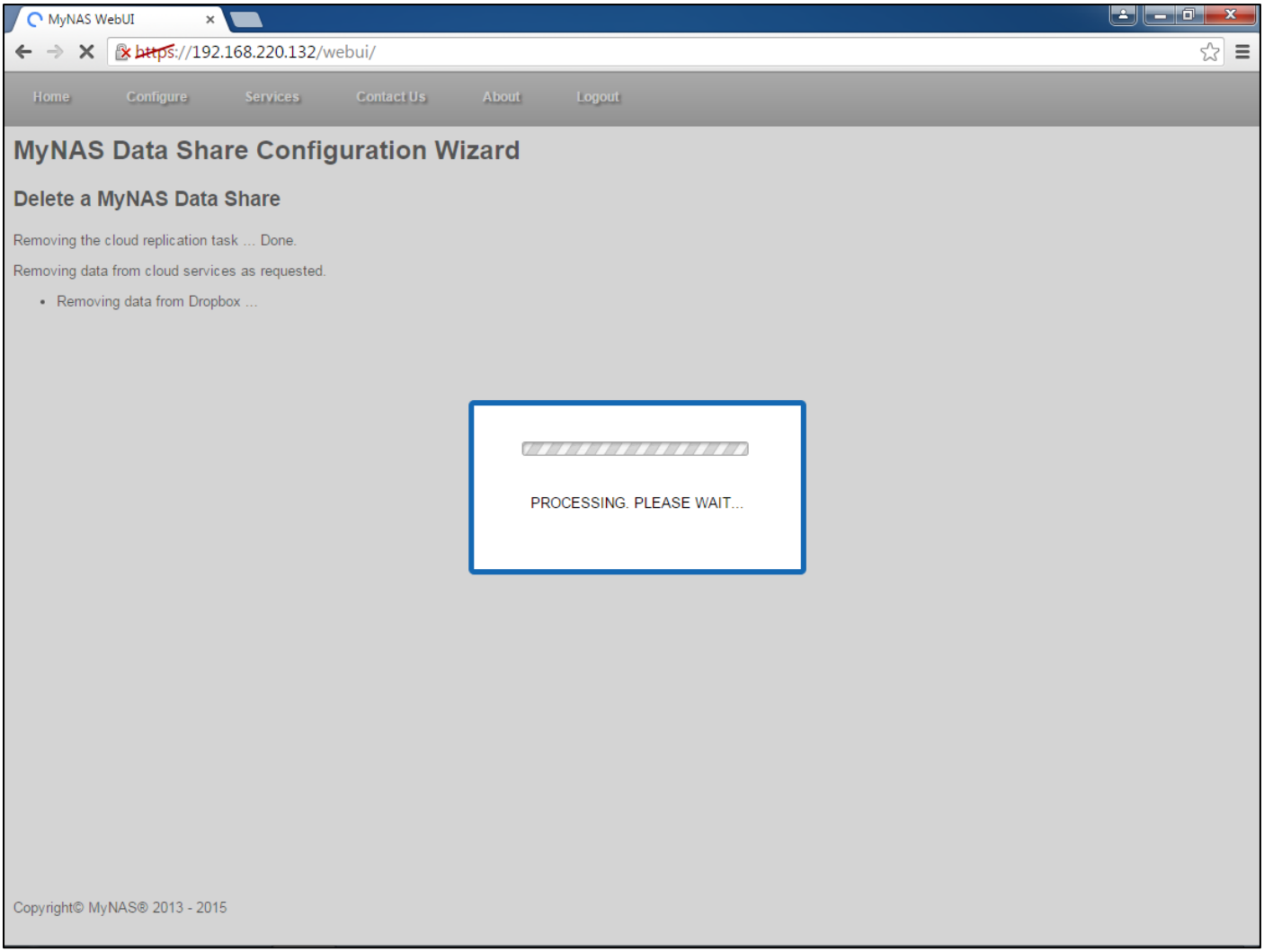
Specific details regarding this MyNAS Data Share will be displayed to help advise and inform you of the data that is present on this data share.

If this Data Share is replicated to a Cloud Replication Partner, the partners will also be displayed, with an option asking do you wish to also remove the data from the Cloud Replication Partners. Click yes to also perform this operation.

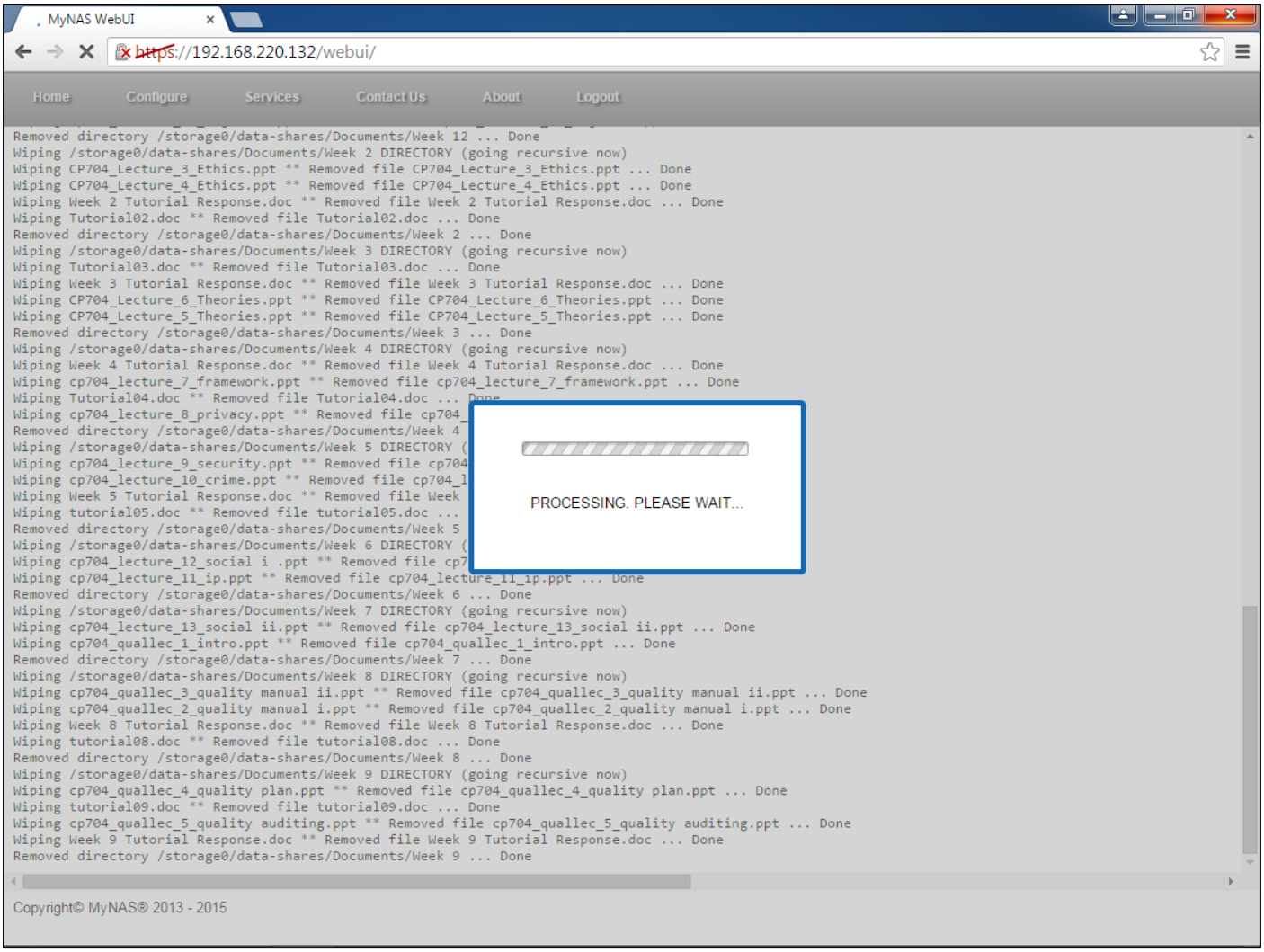
MyNAS also provides the option to securely erase the selected data share. Click yes to also perform this operation.

Note: The secure erase operation is a disk and time intensive process. Allow adequate time for the erase process to complete.

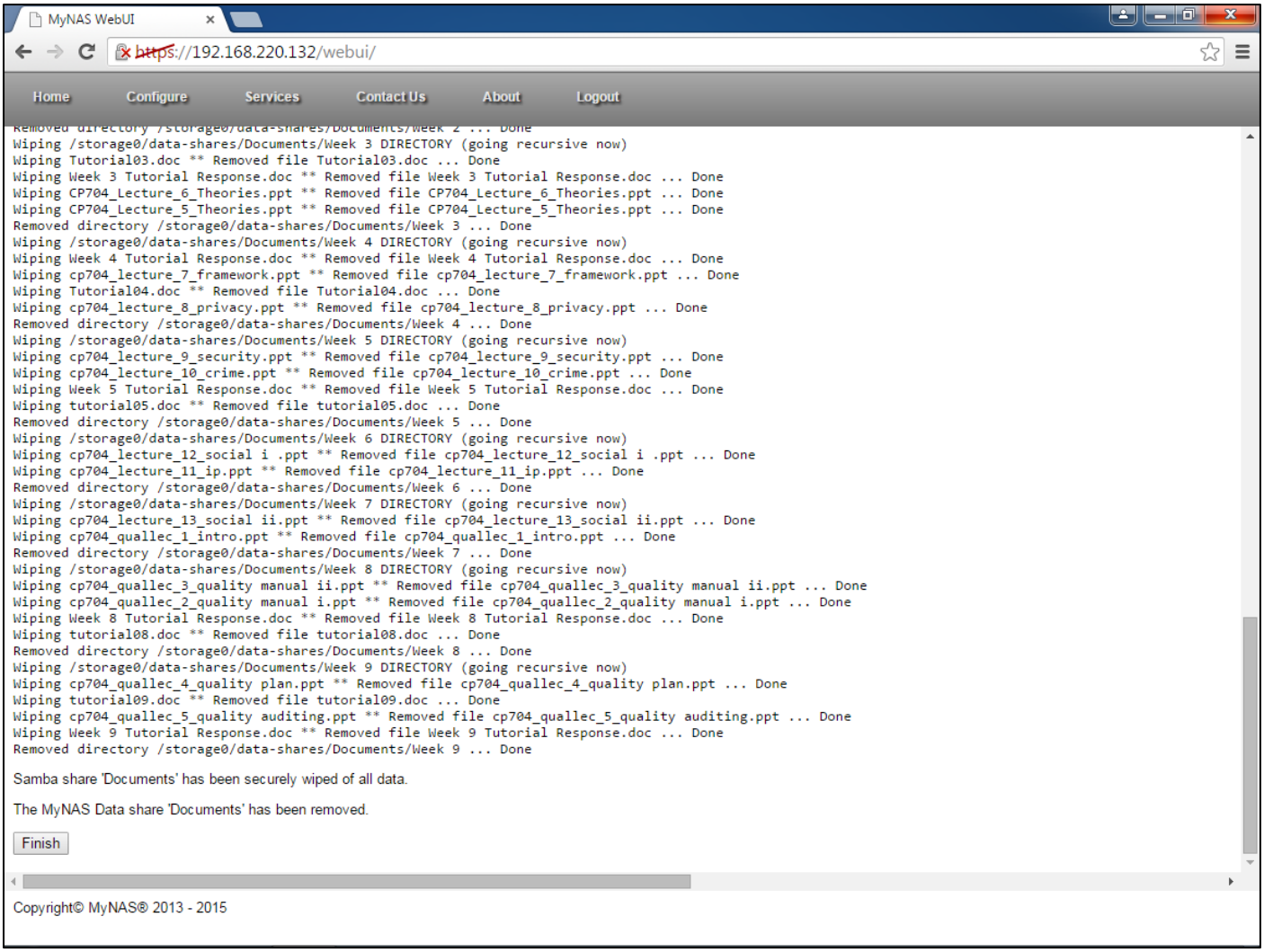
If all is OK to remove this data share, click 'Yes. Remove Data Share' to complete the data share deletion.



If the Data Share was configured for cloud access, and removal of data from the cloud was selected, this data will be removed first.



If Secure Data removal was selected, the deletion process will individually wipe each file in the data share. Once the secure data remove is complete, the data share delete process will complete:

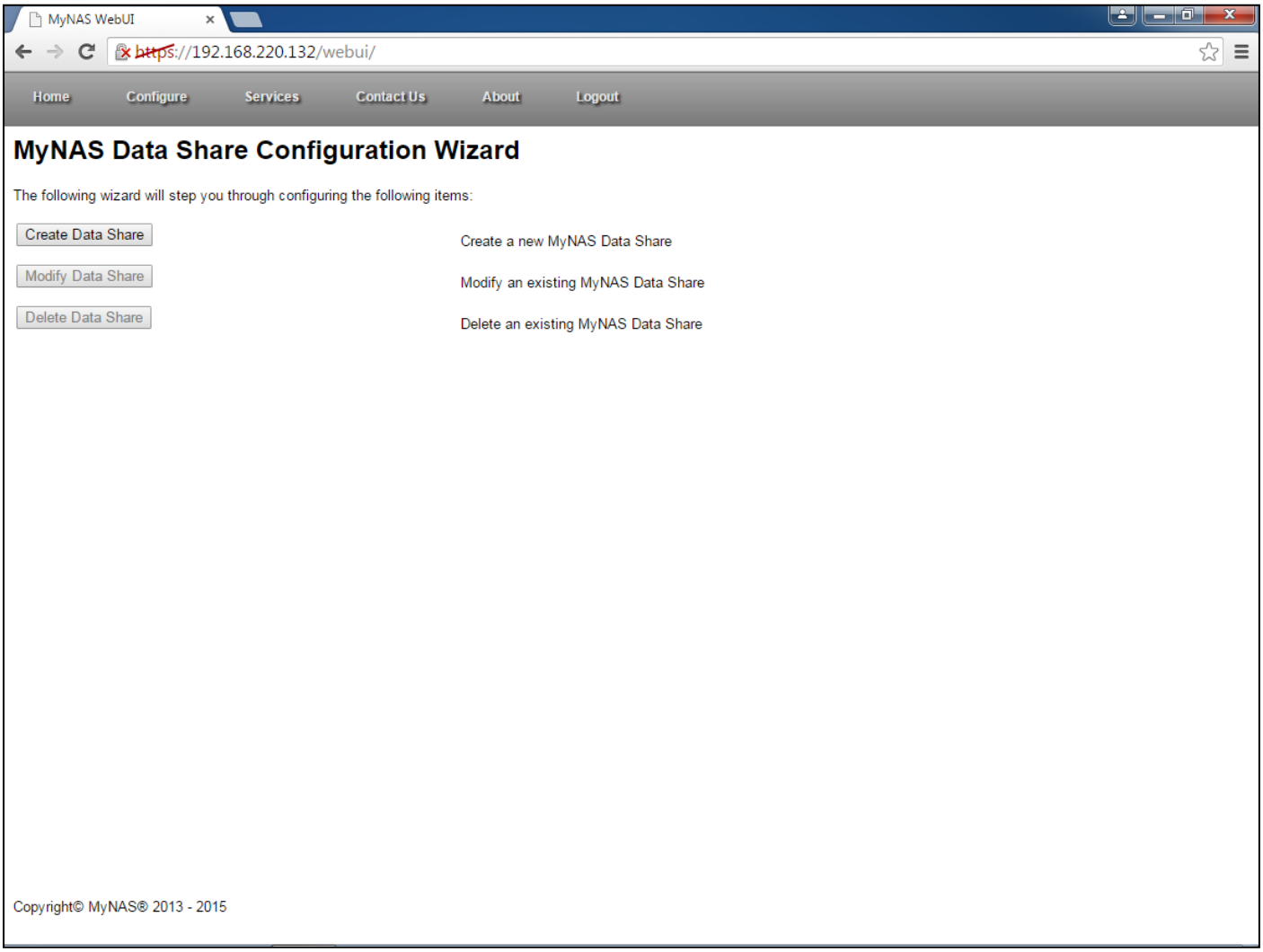


Once the removal is complete, click the 'Finish' button to finish the deletion process.

MyNAS® Storage Appliance Time Machine Support

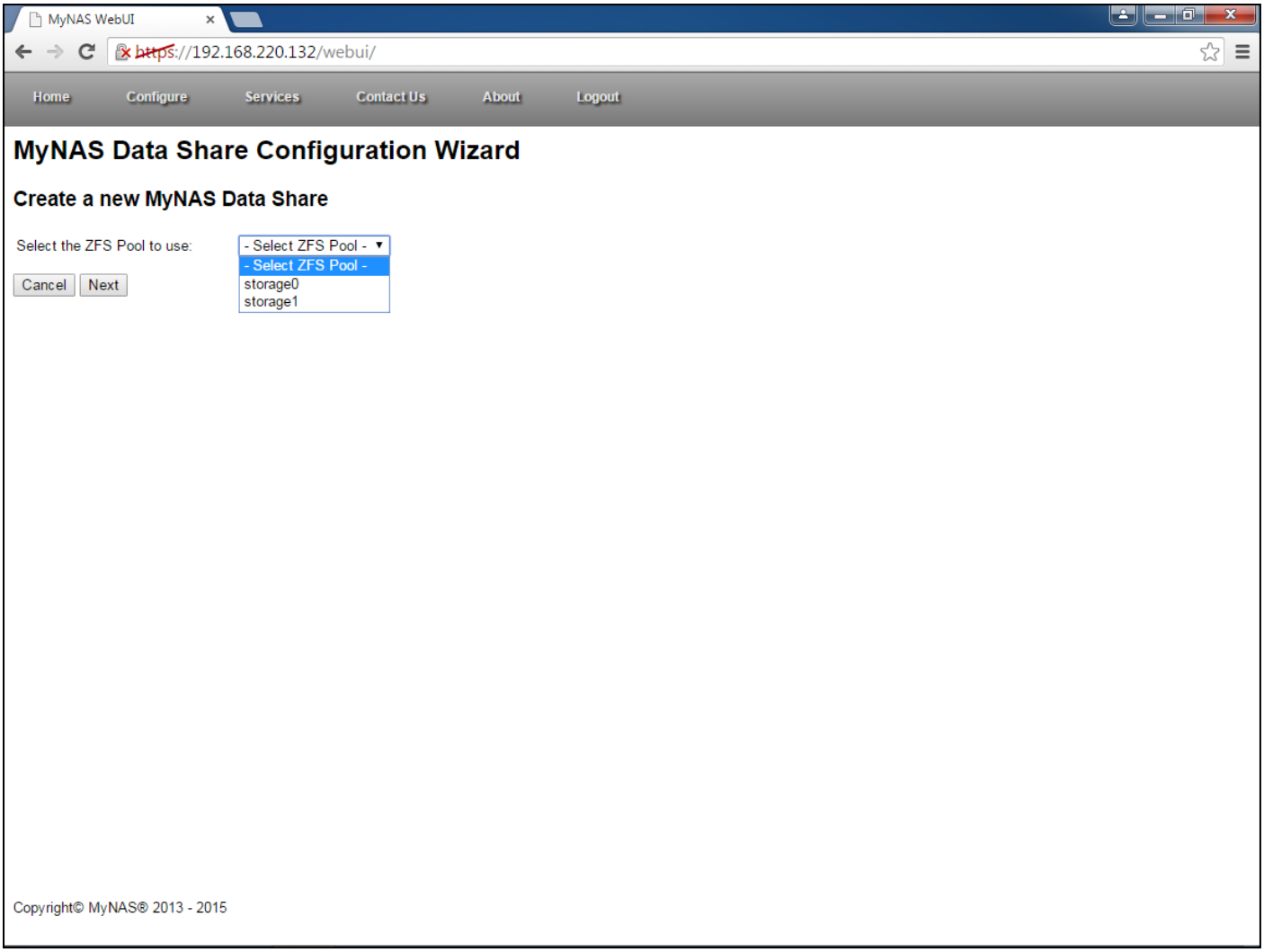
MyNAS Data Shares can provide the support for Apple Time Machine allowing backups of your OS X systems. Typically however, it is recommended that a separate MyNAS Data Share be created specifically just for Time Machine. Follow the directions below for creating a MyNAS Data Share for Time Machine.

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Data Shares'. Once selected, the following will be displayed:



To create a Data Share, click on the 'Create Data Share' button.

Depending on the ZFS Pool configuration, if there is more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for the Data Share creation:

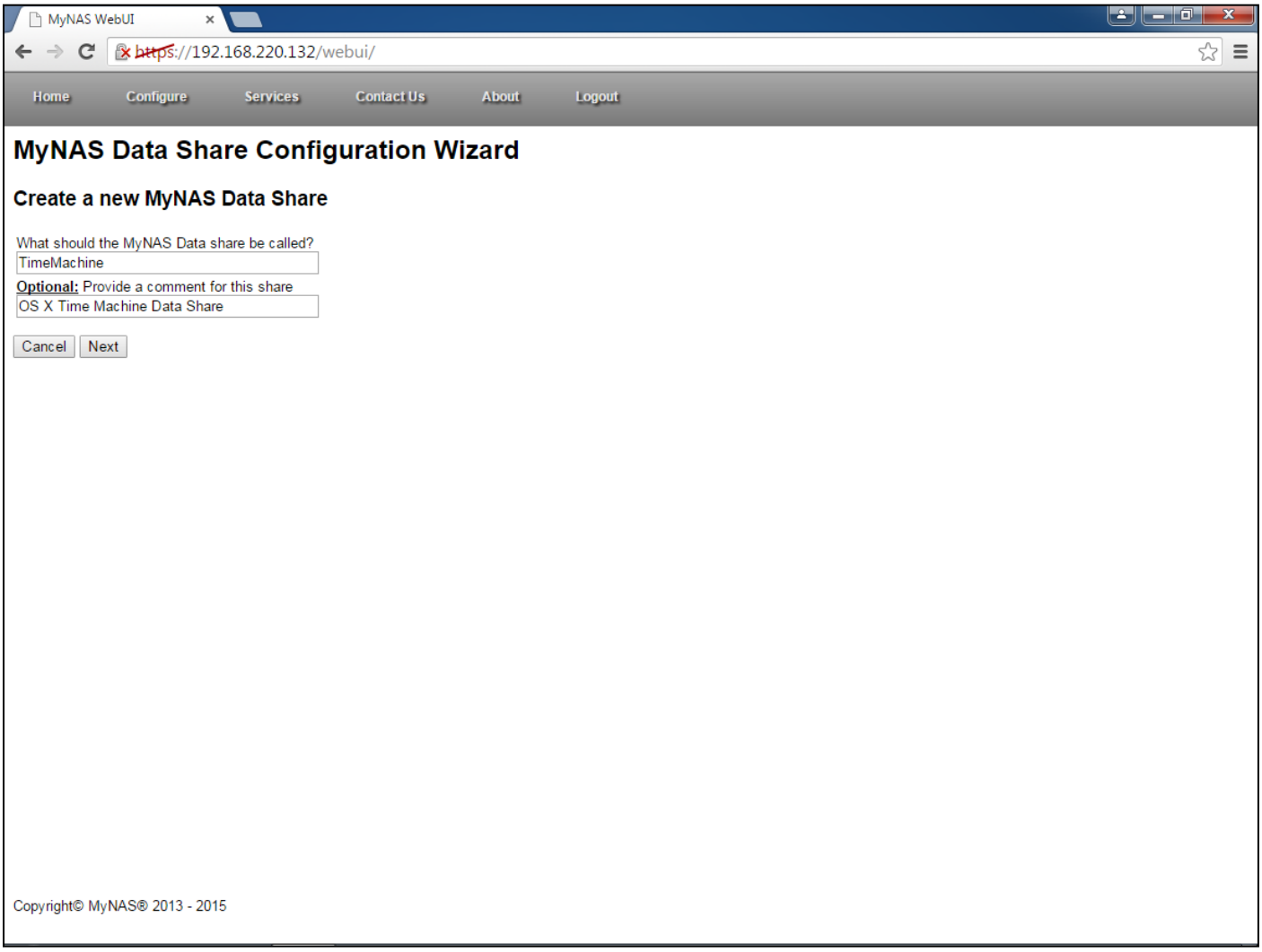


Select the appropriate ZFS Pool and click Next

Configure the Data Share with the appropriate details to identify this Data Share

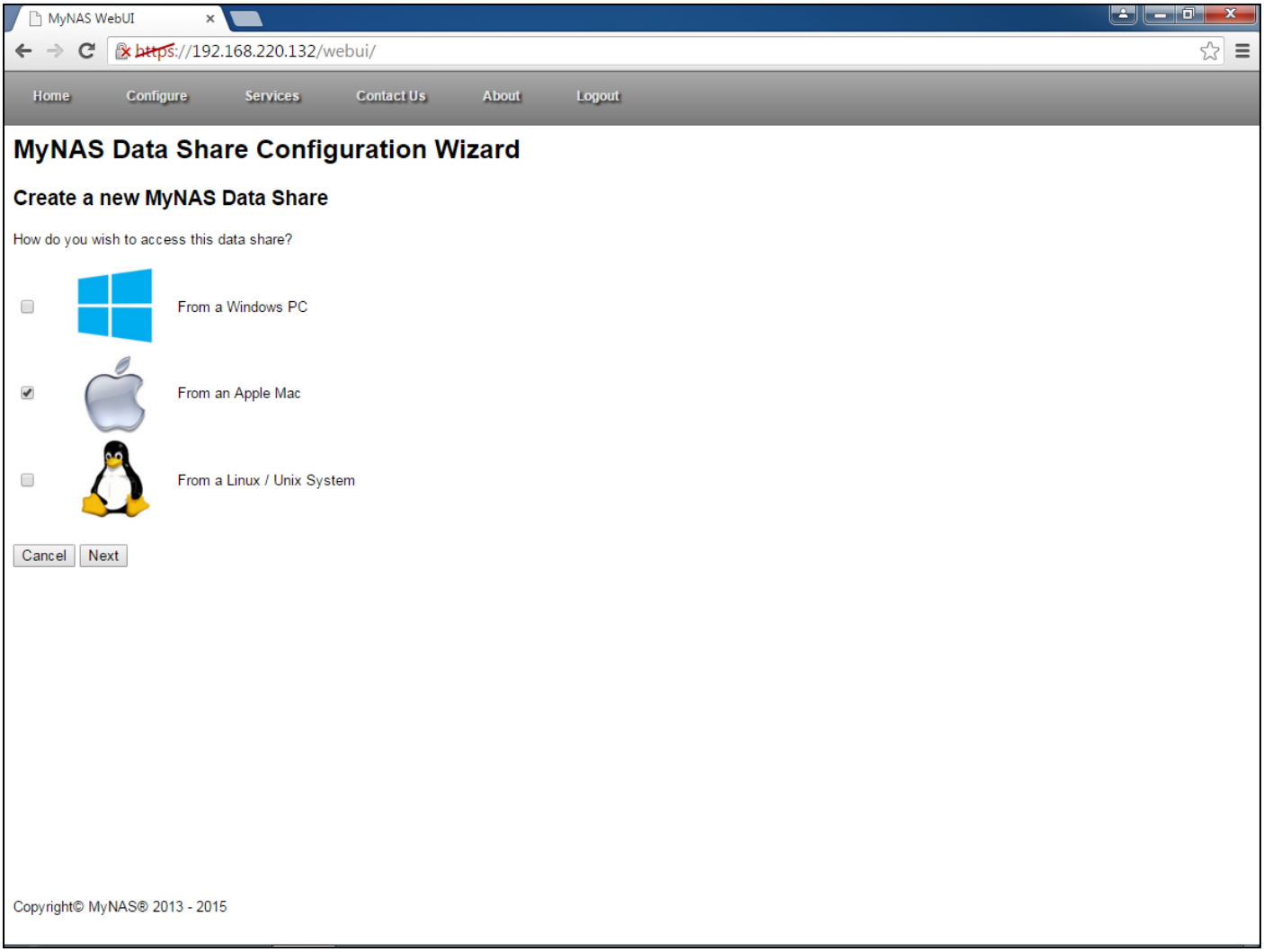
Note: The Data Share name can only contain alpha-numeric characters, including '-' and '_'

Note: The Data Share comment is as per the share name, however also including spaces and '.'



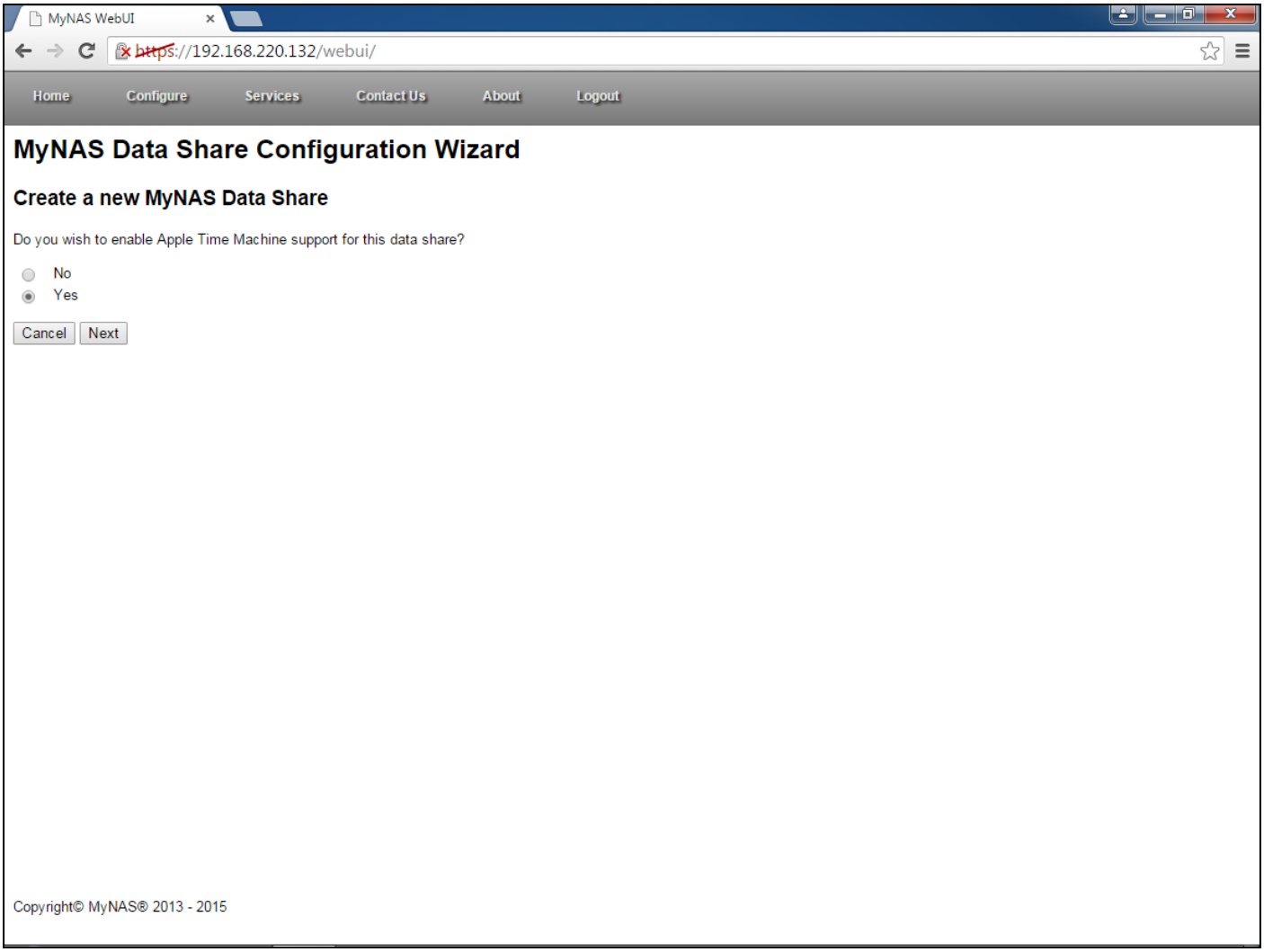
Once the new Data Share details have been configured, click 'Next'

Select the access mechanism as from an Apple Mac



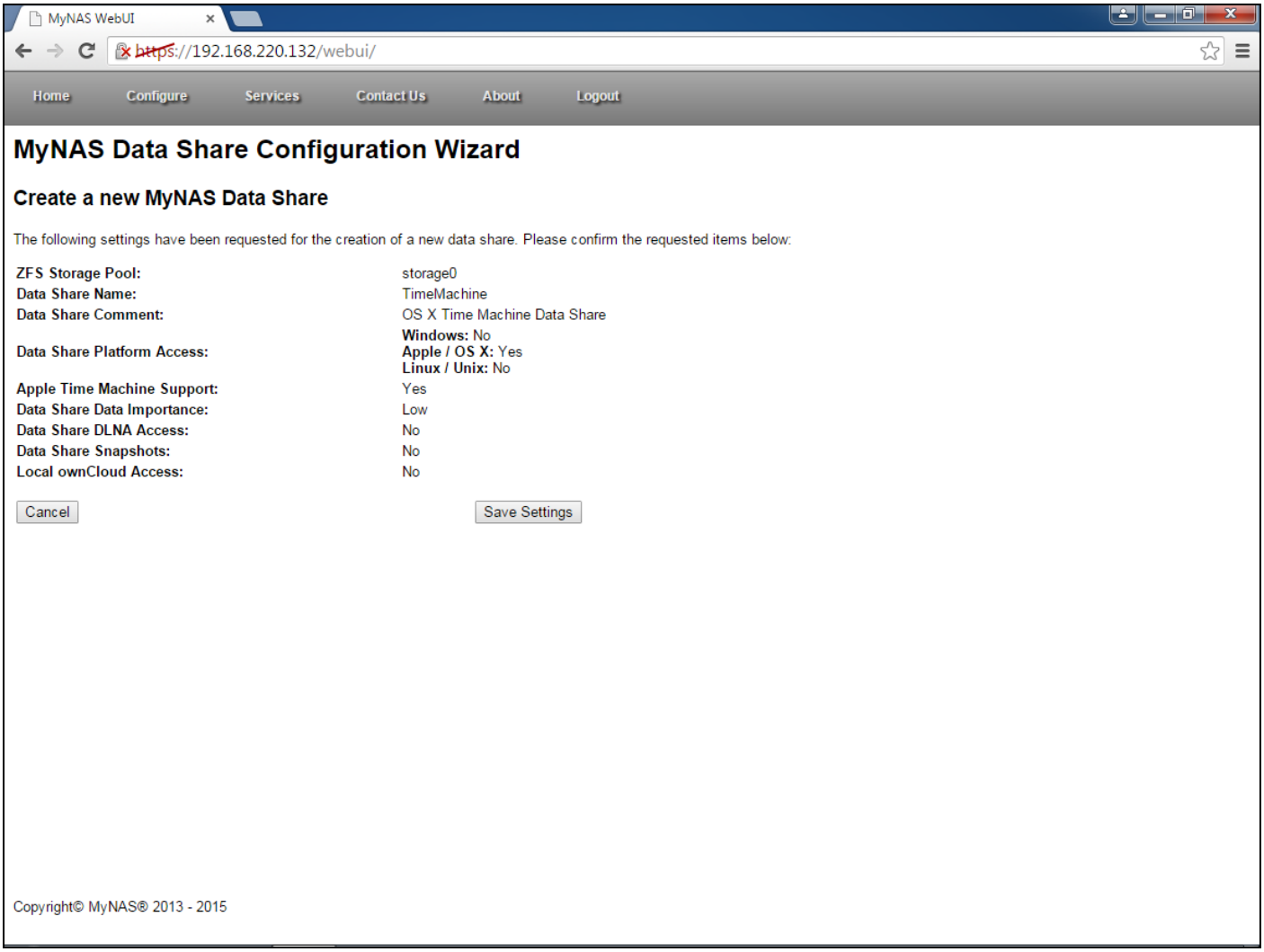
Click 'Next' to continue

Select 'Yes' to enable Time Machine Support

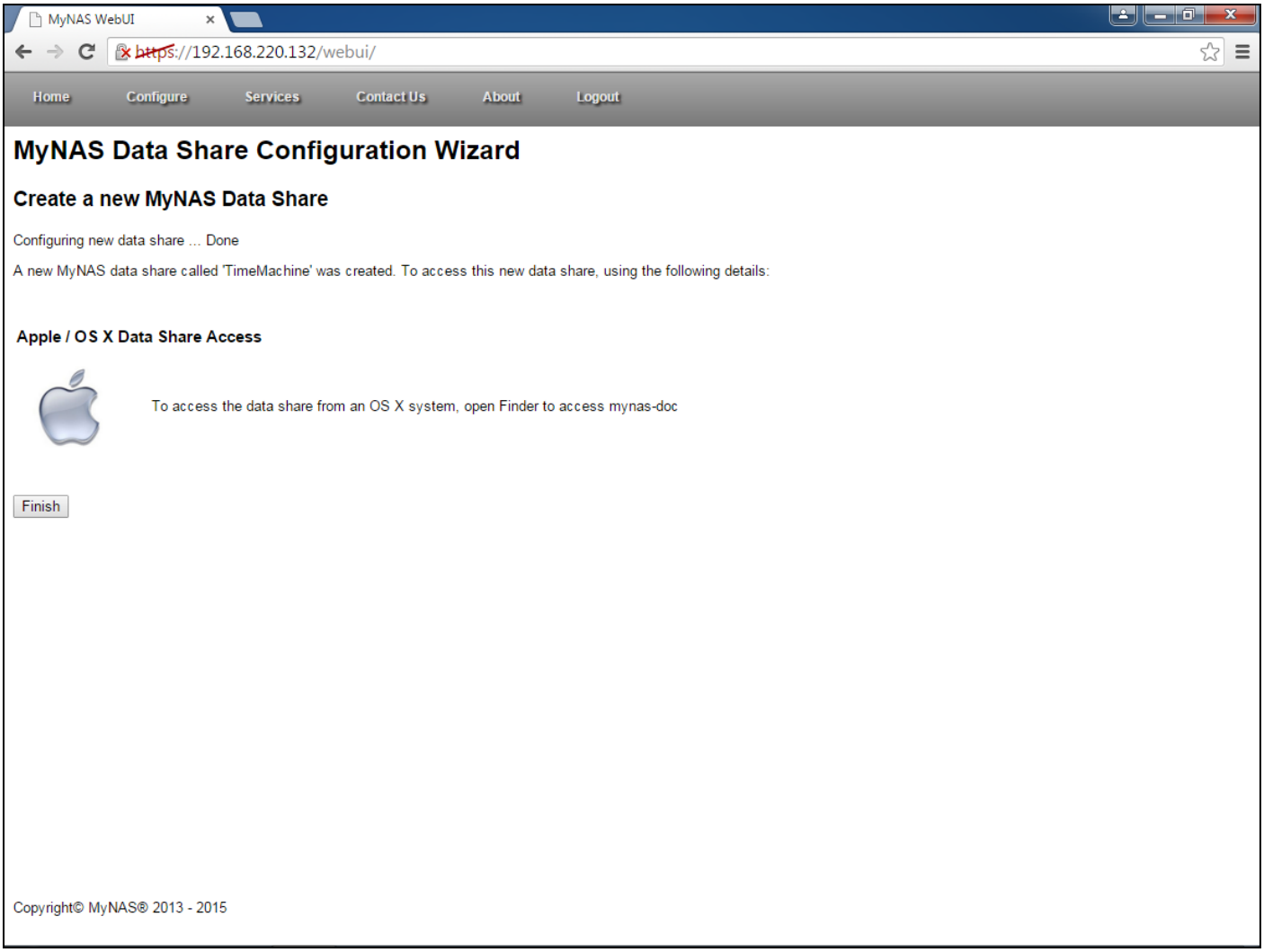


Click 'Next' to continue, and through all remaining wizard screens leaving the remaining options at their defaults.

Confirm the settings for this Data Share for just Apple access and Time Machine support:



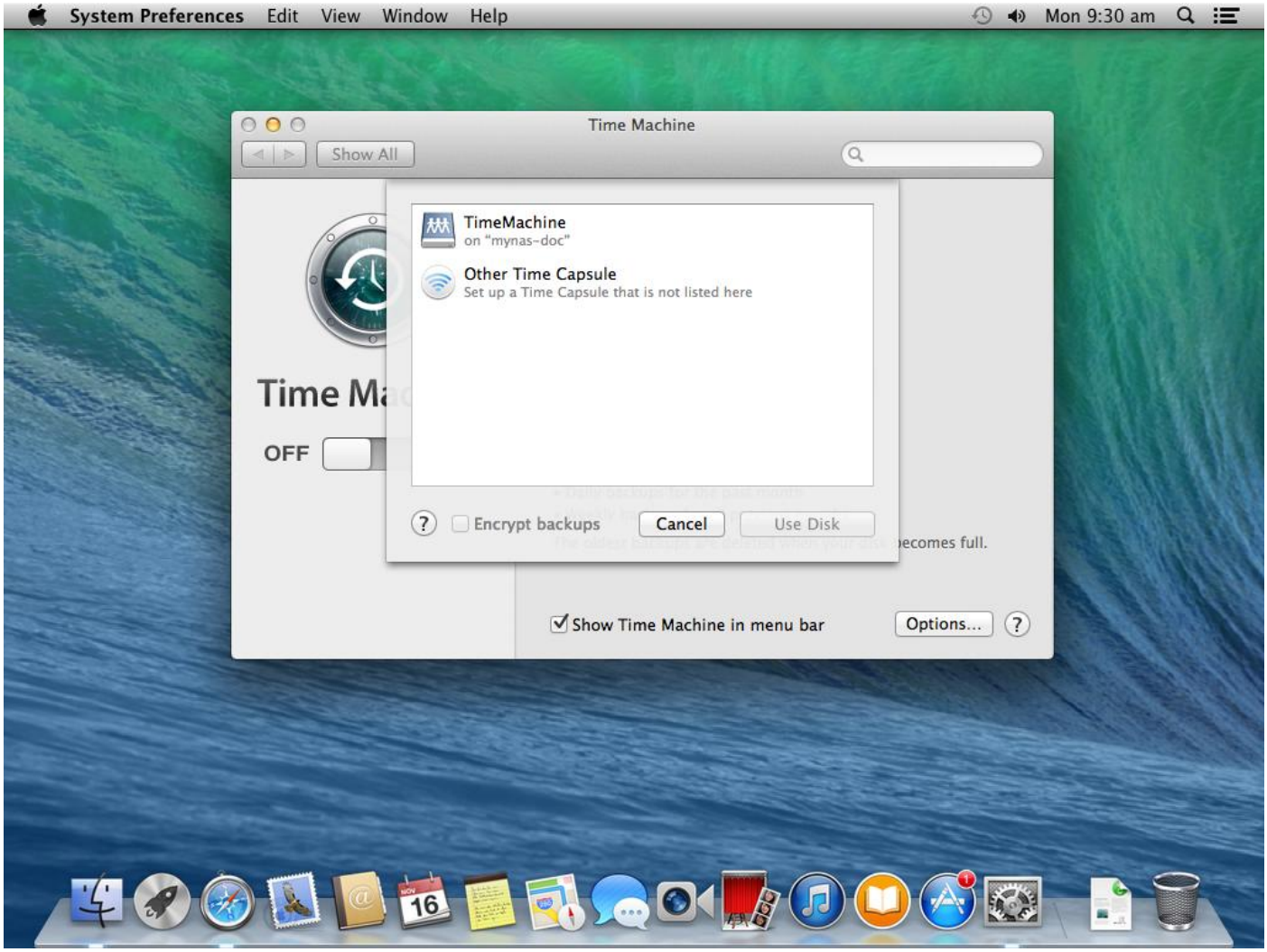
Once confirmed, click 'Save Settings' and the new Data Share will be created.



Click 'Finish' to close the Data Share wizard.

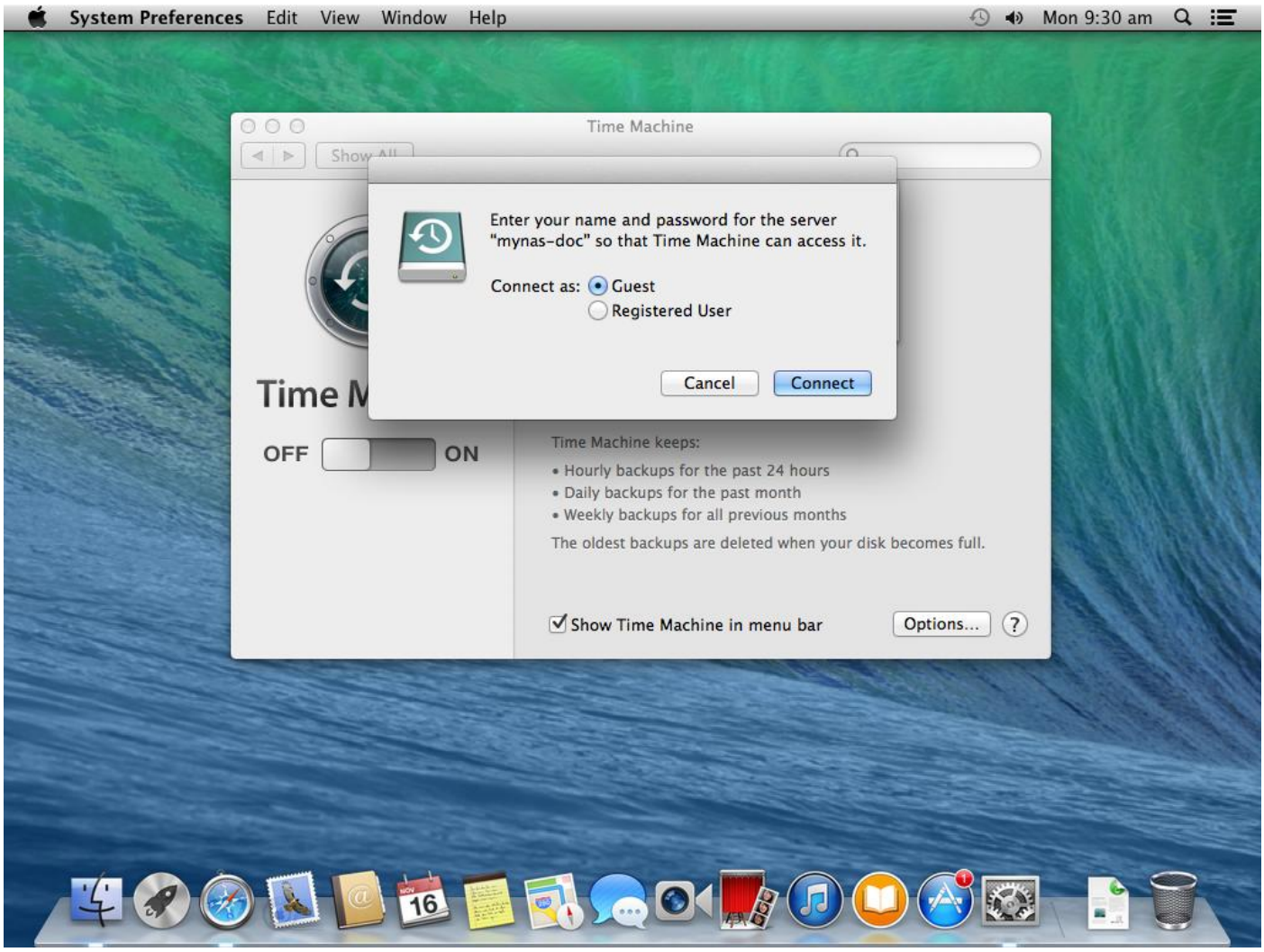
From OS X, launch the Time Machine application:

Click on the 'Select Backup Disk' button to select the Time Machine Data Share



Select the Time Machine Data Share and click the 'Use Disk' button. Optionally, check the 'Encrypt backups' checkbox if you wish to have OS X encrypt your Time Machine backups.

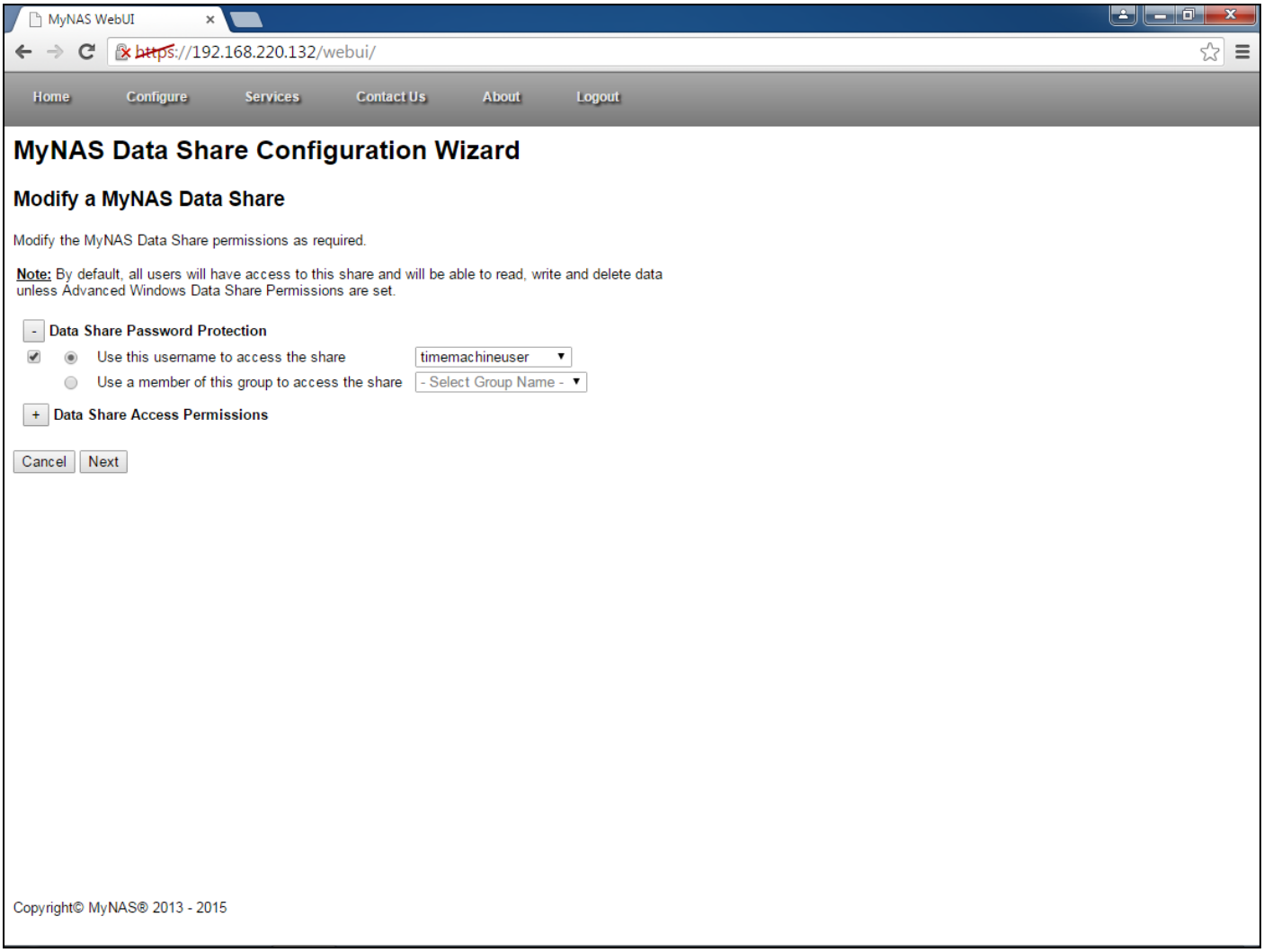
Time Machine will now prompt for a user to connect to the Time Machine Data Share. As no username was used when the data share was created, use the Guest account for the backups.

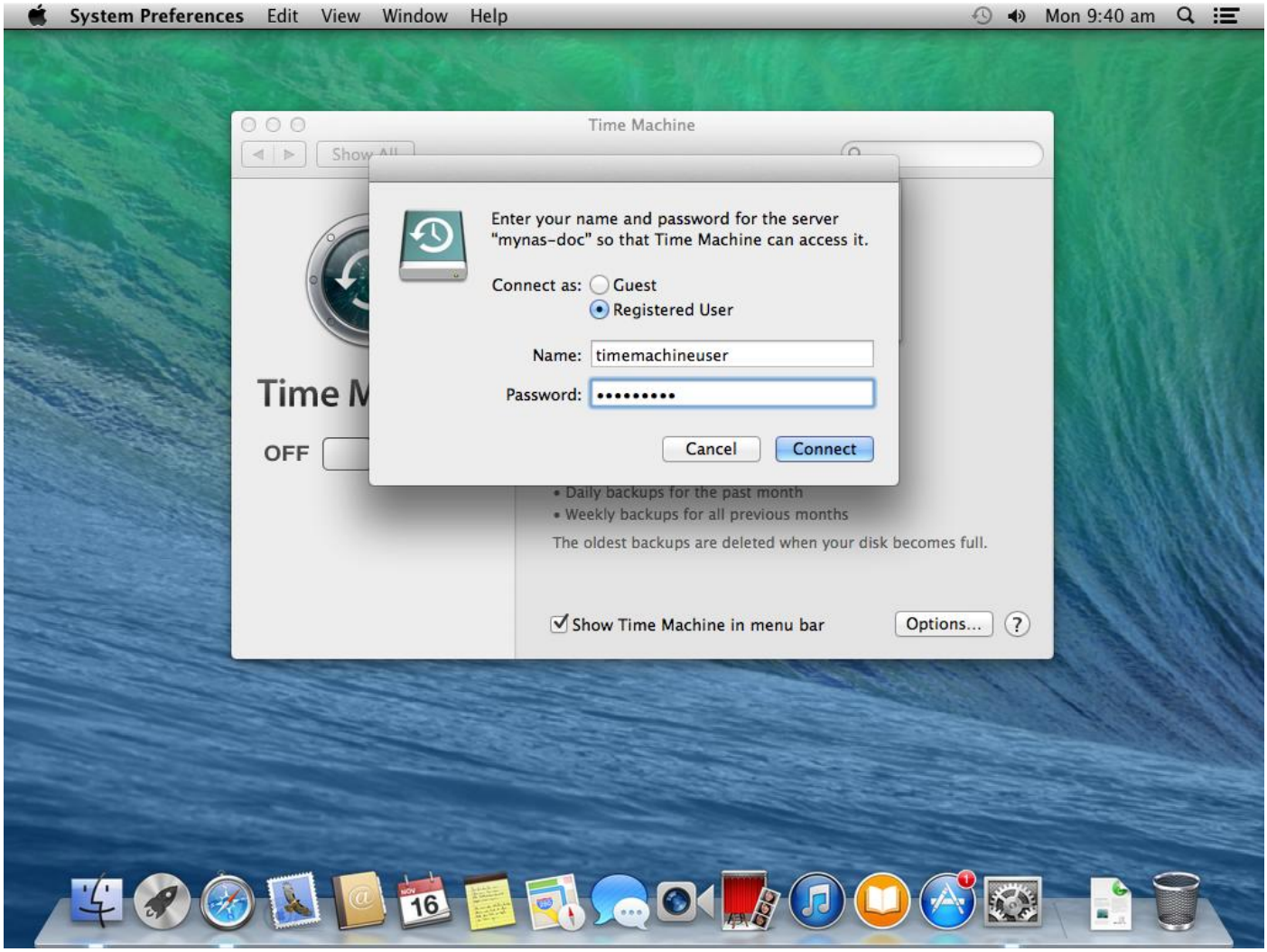


Click the 'Connect' button to complete the Time Machine configuration

Time Machine is now configured to use MyNAS as its backup storage device.

If you do wish to connect with a specific user account, use the MyNAS Configure Users & Groups Wizard to add a specific user account and then modify this Time Machine Data Share to allow access by that specific user.



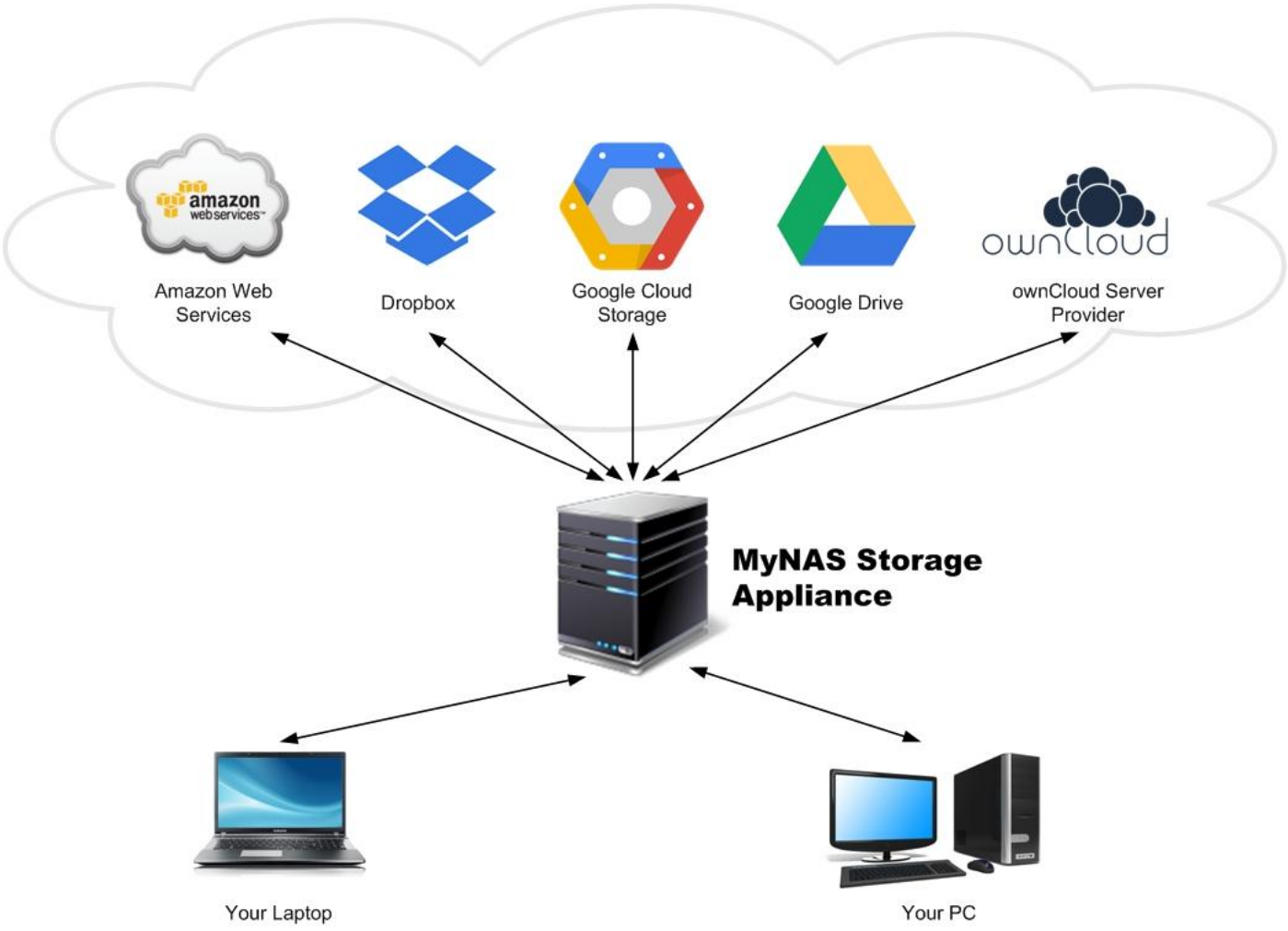


Click Connect to configure Time Machine to use this registered user

Time machine will now be configured and it will configure itself to perform a backup of your OS X system to the MyNAS Time Machine Data Share:

MyNAS® Storage Appliance Cloud Replication

MyNAS provides the capability for you to replicate any selected Data Share with encrypted or un-encrypted data to a MyNAS Storage Appliance supported Cloud Storage provider. The diagram below illustrates the Cloud Storage providers that are currently integrated into MyNAS:



When replicating data to the Cloud Replication Partners, all access where possible will be secured using SSL, keeping your uploads safe.

Important

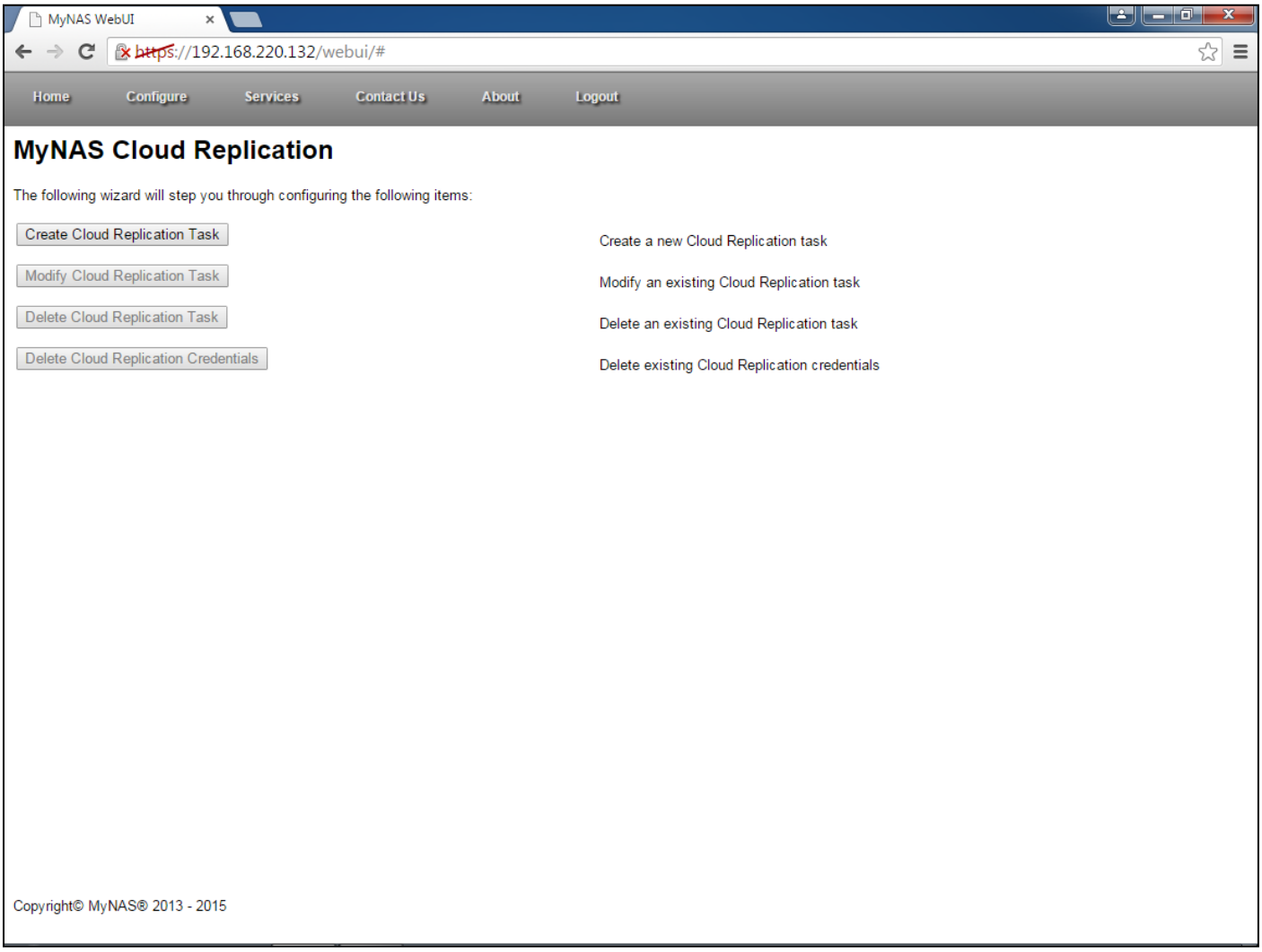
Uploading data to a Cloud Provider will use your Internet bandwidth and your data allowance from your ISP.

Only replicate data that should be replicated such as important documents, or photos. Data such as video files or very large files should not be replicated to the cloud. Uploading these sort of files not only consumes and uses all your data allowance quickly, however you may also incur a charge from your selected Cloud Replication Partner due to the storage space now consumed.

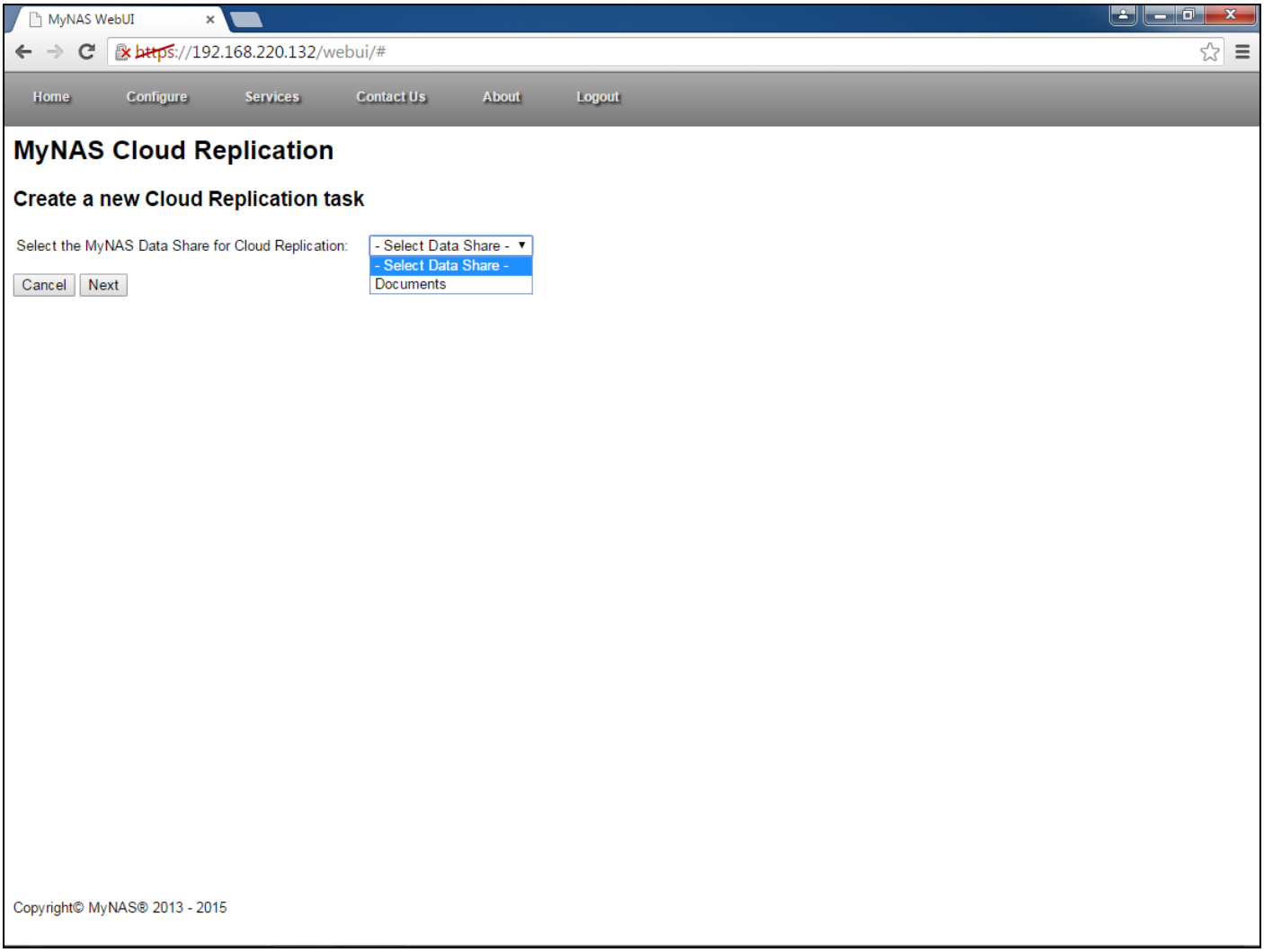
Create a new Cloud Replication Task

To create a new Cloud Replication Task, on your MyNAS storage appliance, follow the directions below.

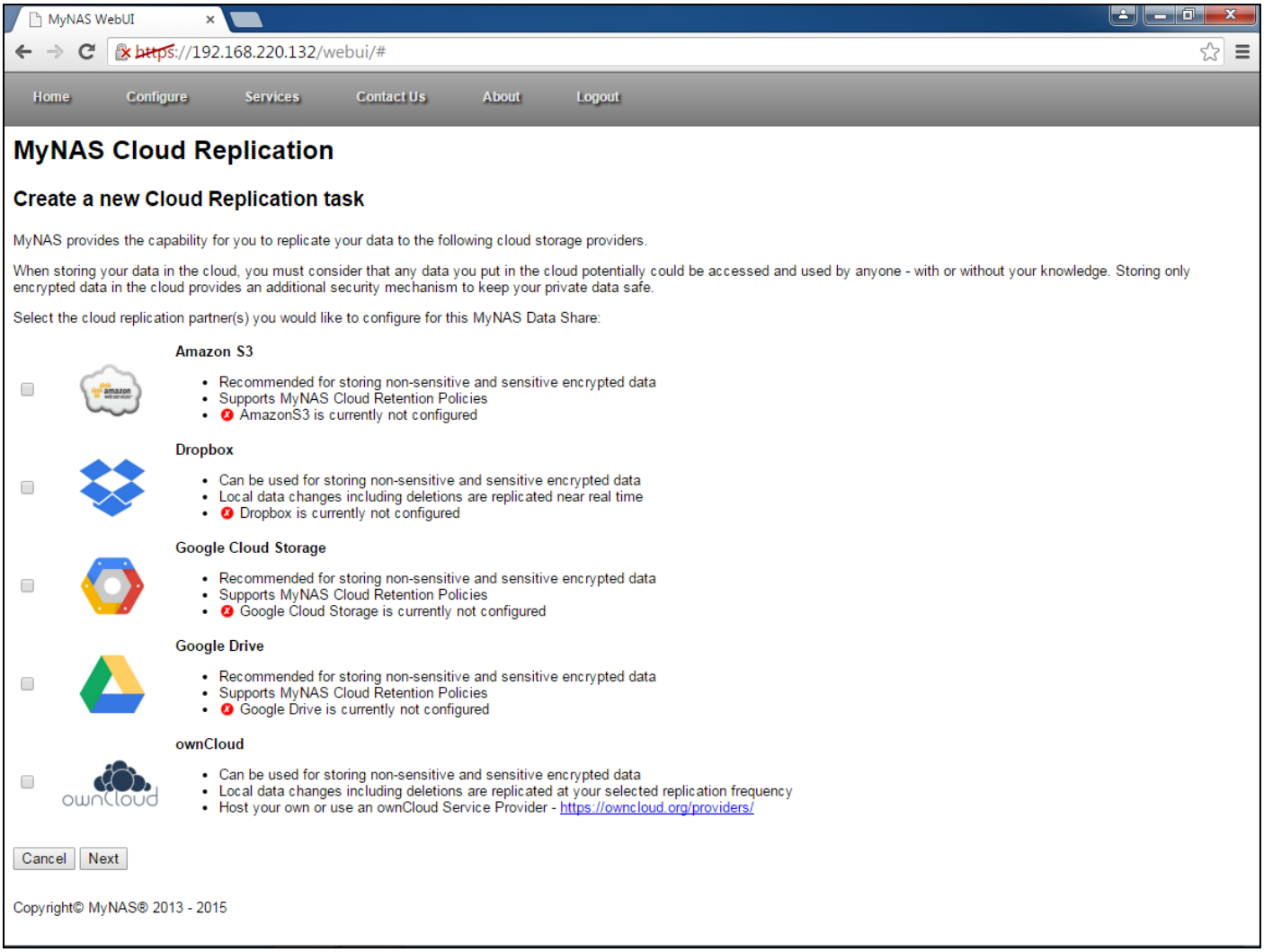
Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Cloud Replication'. Once selected, the following will be displayed:



Click the "Create Cloud Replication Task" to create a new task.



Select the MyNAS Data Share which you would like to replicate to the cloud and click Next



Select the Cloud Replication Partners that you would like to use to replicate this Data Share to.

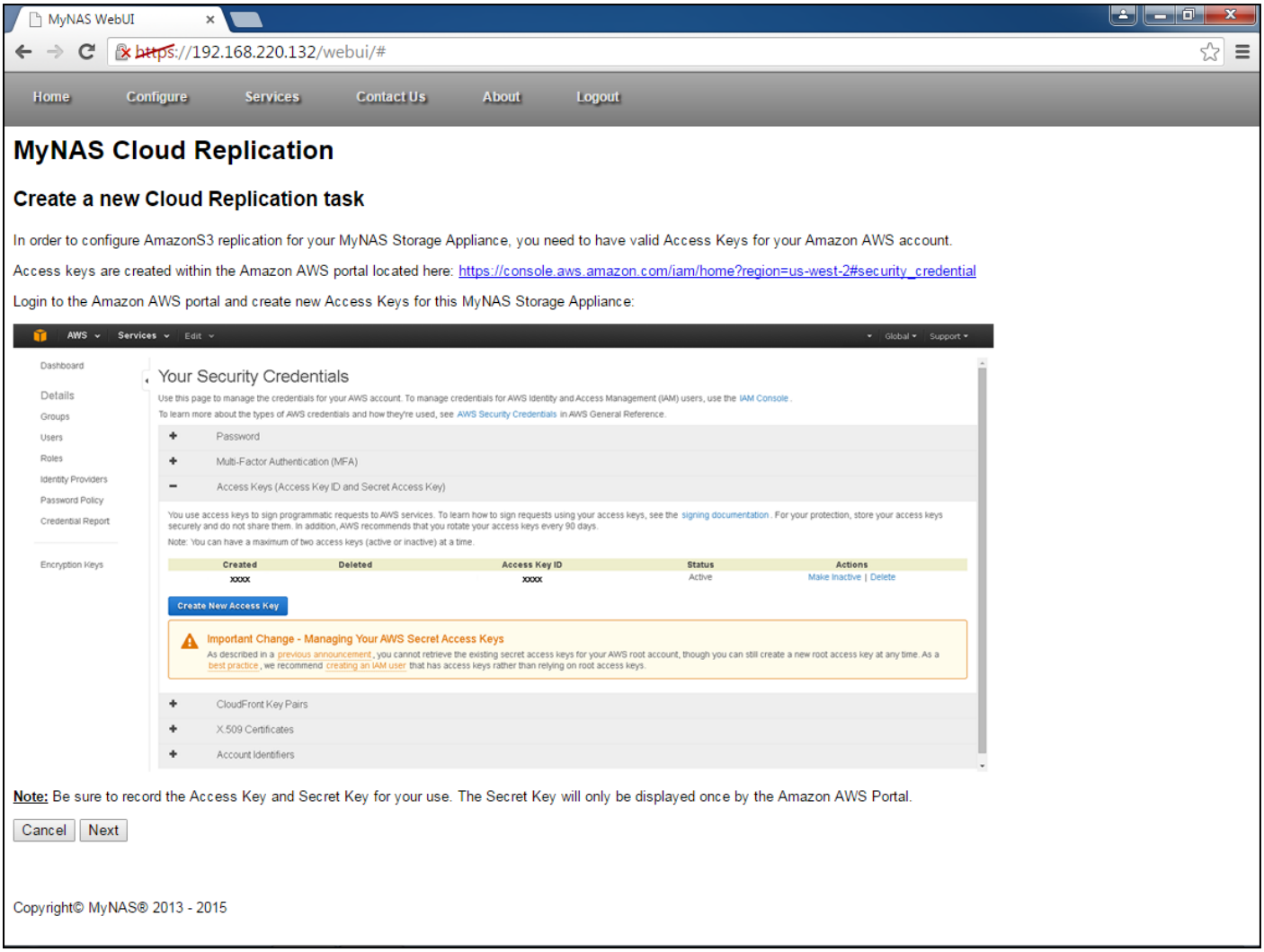
Depending on which partners are selected, configuration options for each selected replication partner will be requested.

Once all the required Cloud Replication Partners are selected, click Next

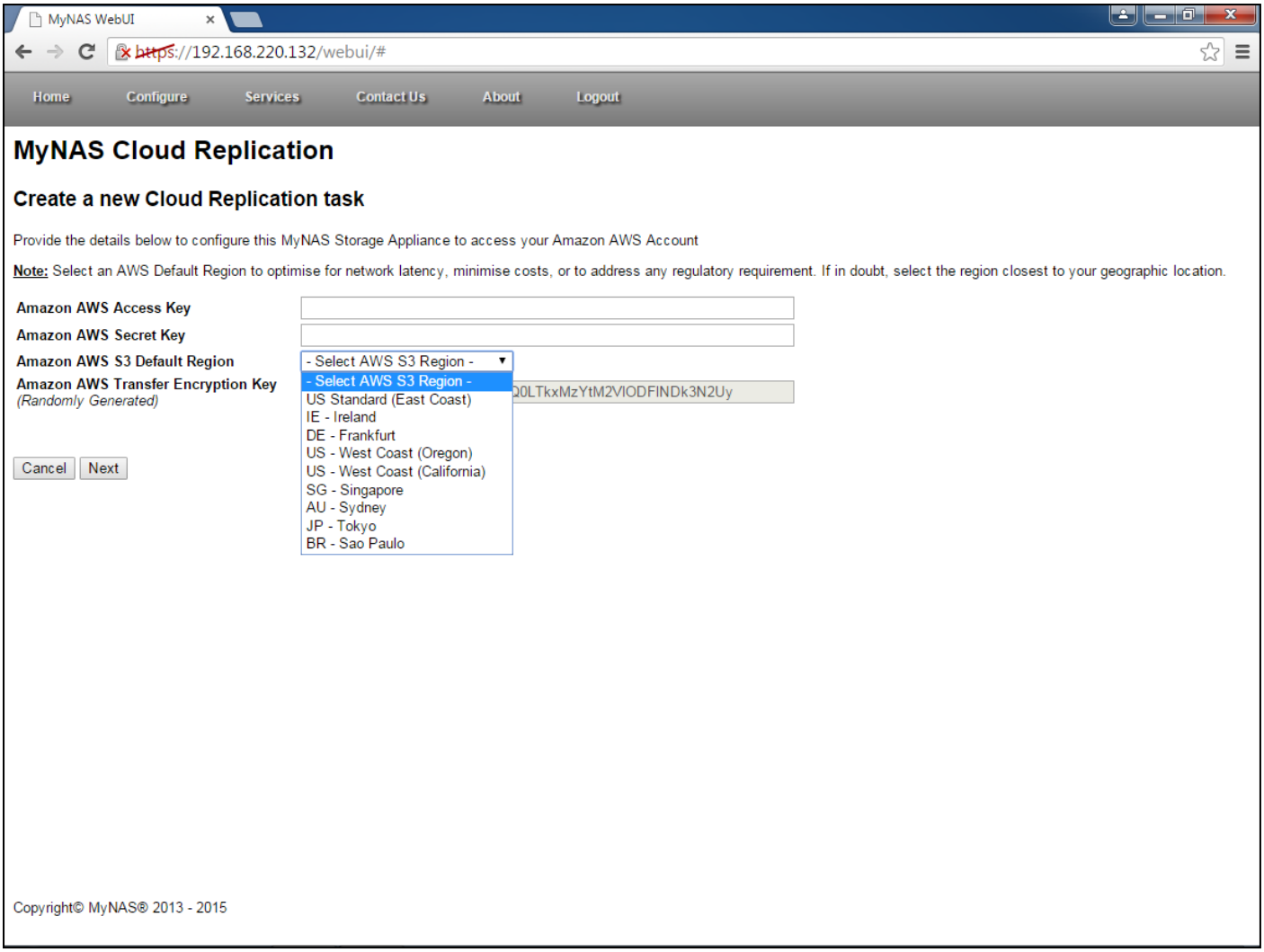
AmazonS3 Cloud Replication

When selecting AmazonS3, if this has not been configured before, the following will be displayed, detailing specific instructions on what is needed to configure this Cloud Replication Partner access. On the AmazonS3 site, you will need to generate the following:

- AWS Access Key
- AWS Secret Key



Once you have these credentials, click Next

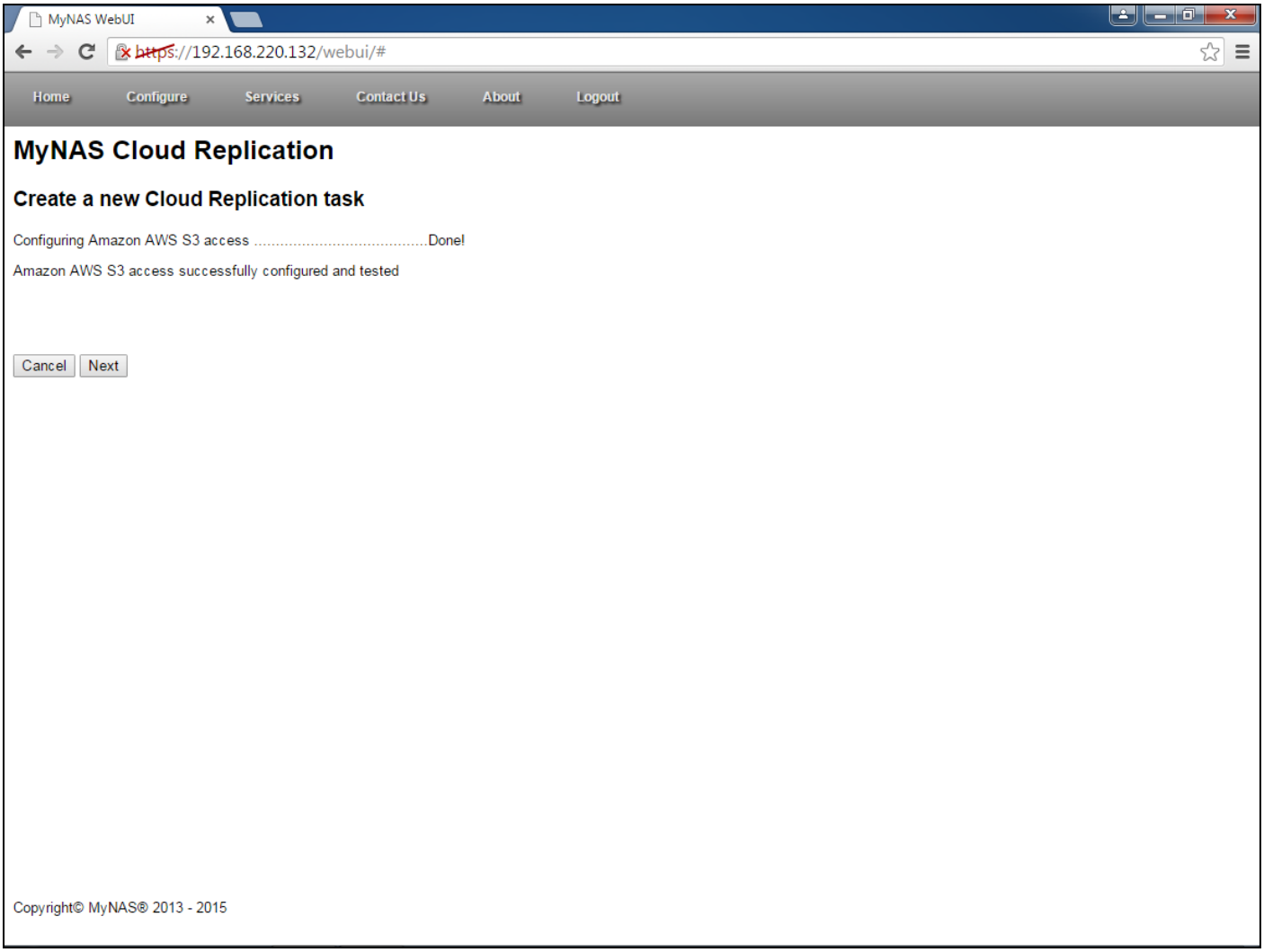


Enter in your AWS Access and AWS Secret keys, then select an applicable AWS region to store your data in.

It is advisable to store your data in a region as close as possible to where you live, or select a region that you are comfortable with in keeping your data safe.

Further reading: https://aws.amazon.com/compliance/data-privacy-faq/

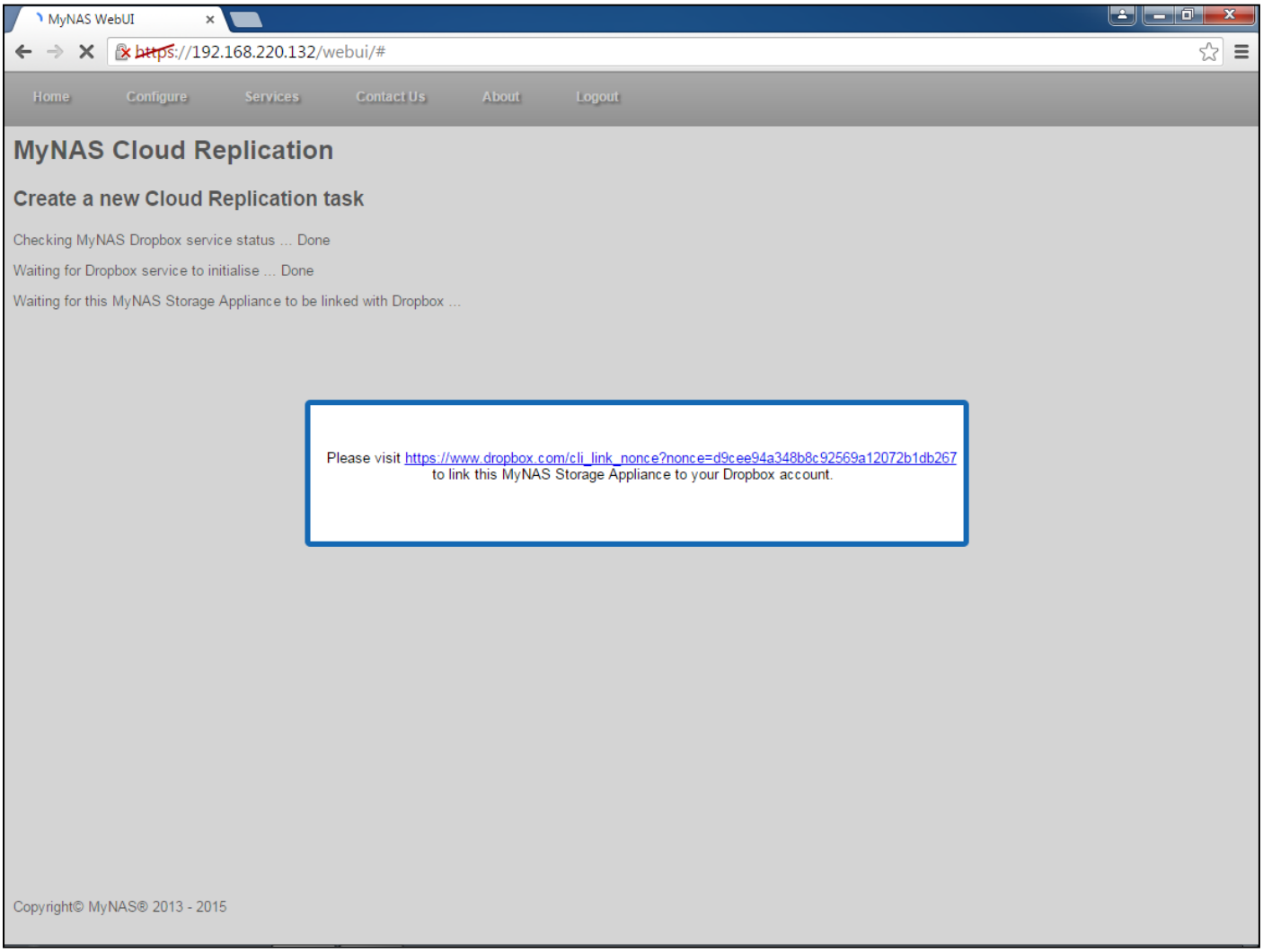
Once a region is selected, click Next



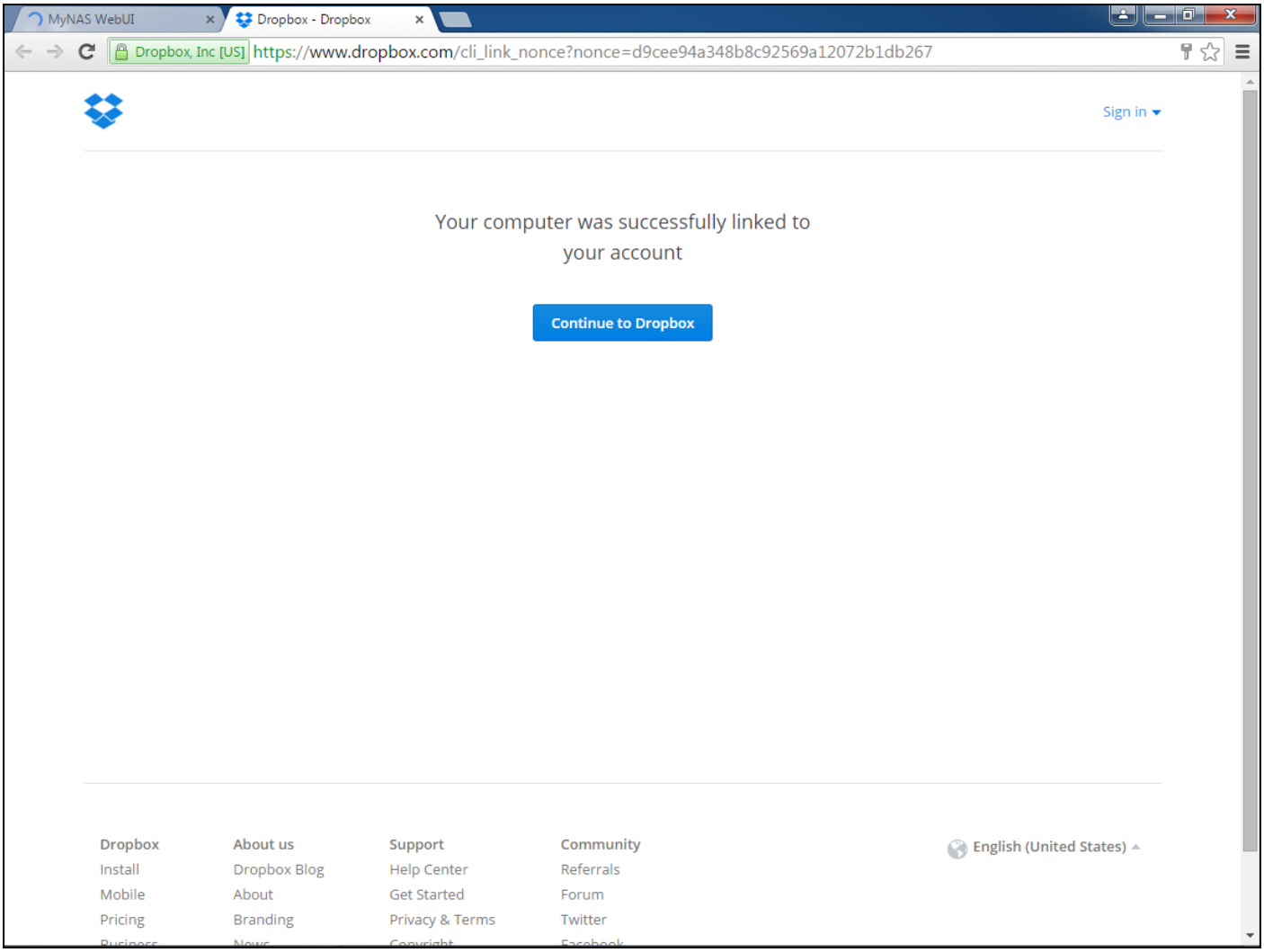
MyNAS will now configure the AmazonS3 client using the access credentials provided. Click Next to continue.

Dropbox

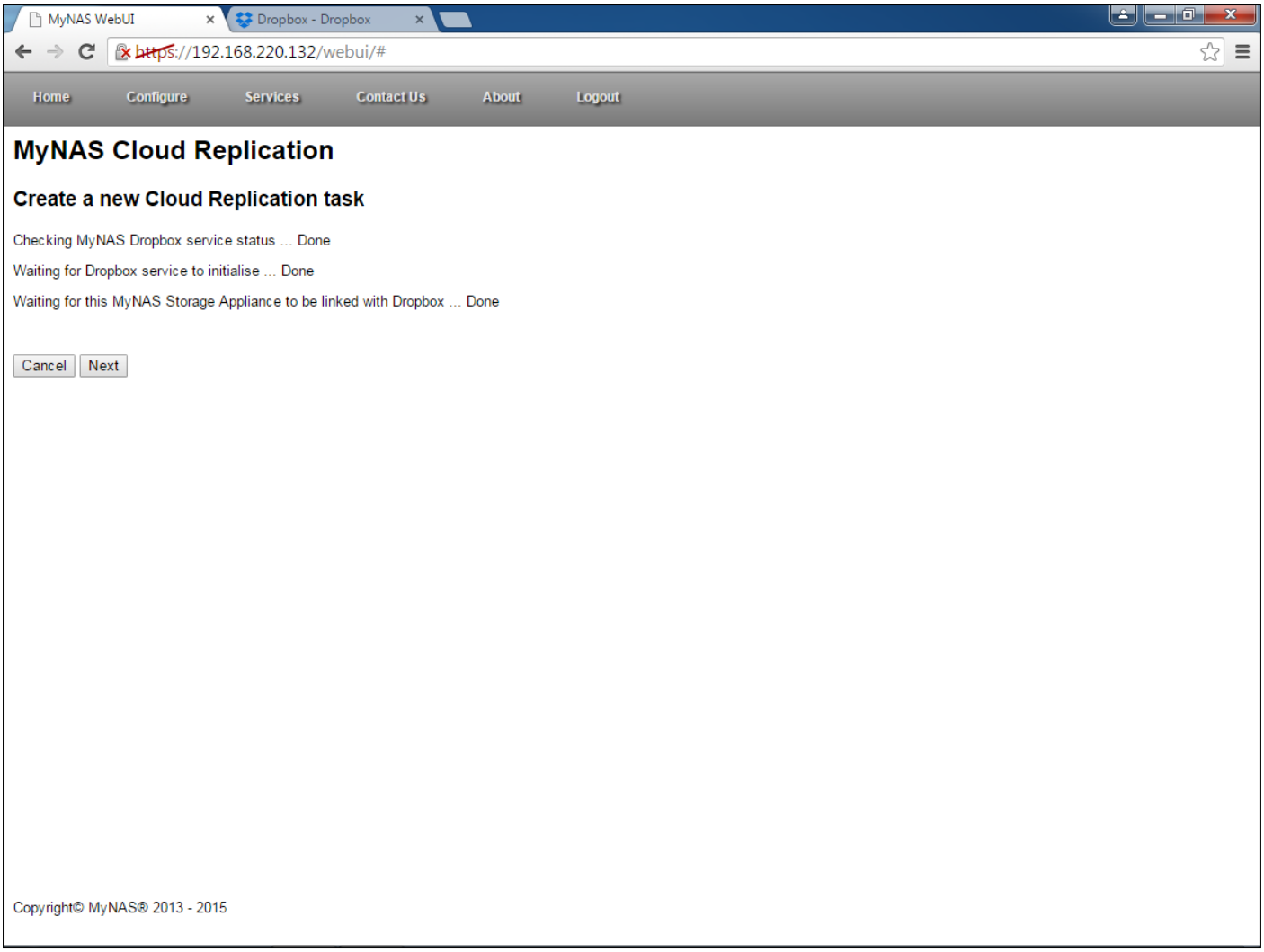
When configuring Dropbox for the first time, MyNAS will display a URL requesting you to link your MyNAS Storage Appliance with your Dropbox account.



Click the URL, sign into Dropbox to link the MyNAS Storage Appliance



Once your MyNAS Storage Appliance is linked, go back to the MyNAS WebUI tab and the Dropbox configuration will complete

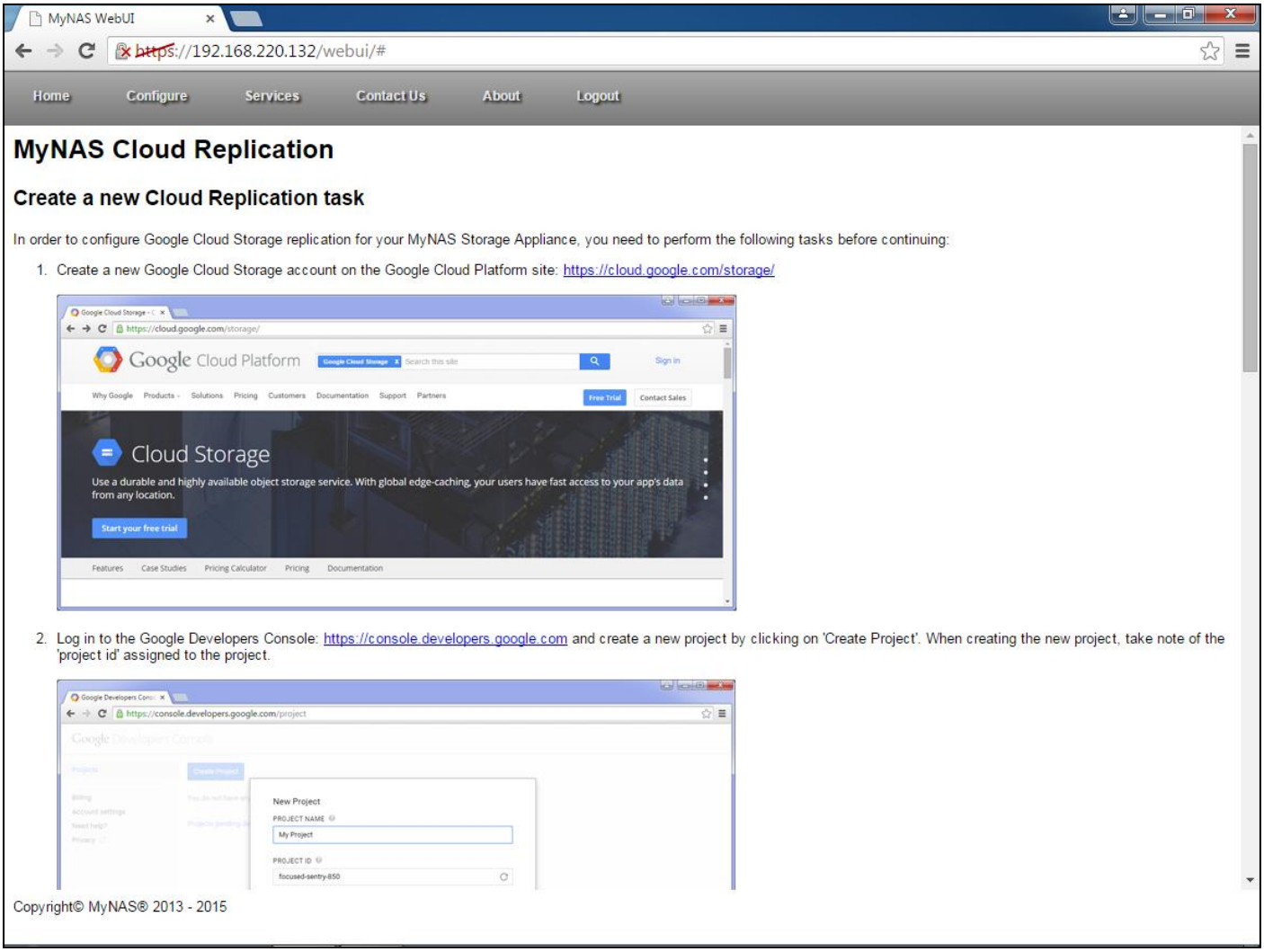


Click Next to continue

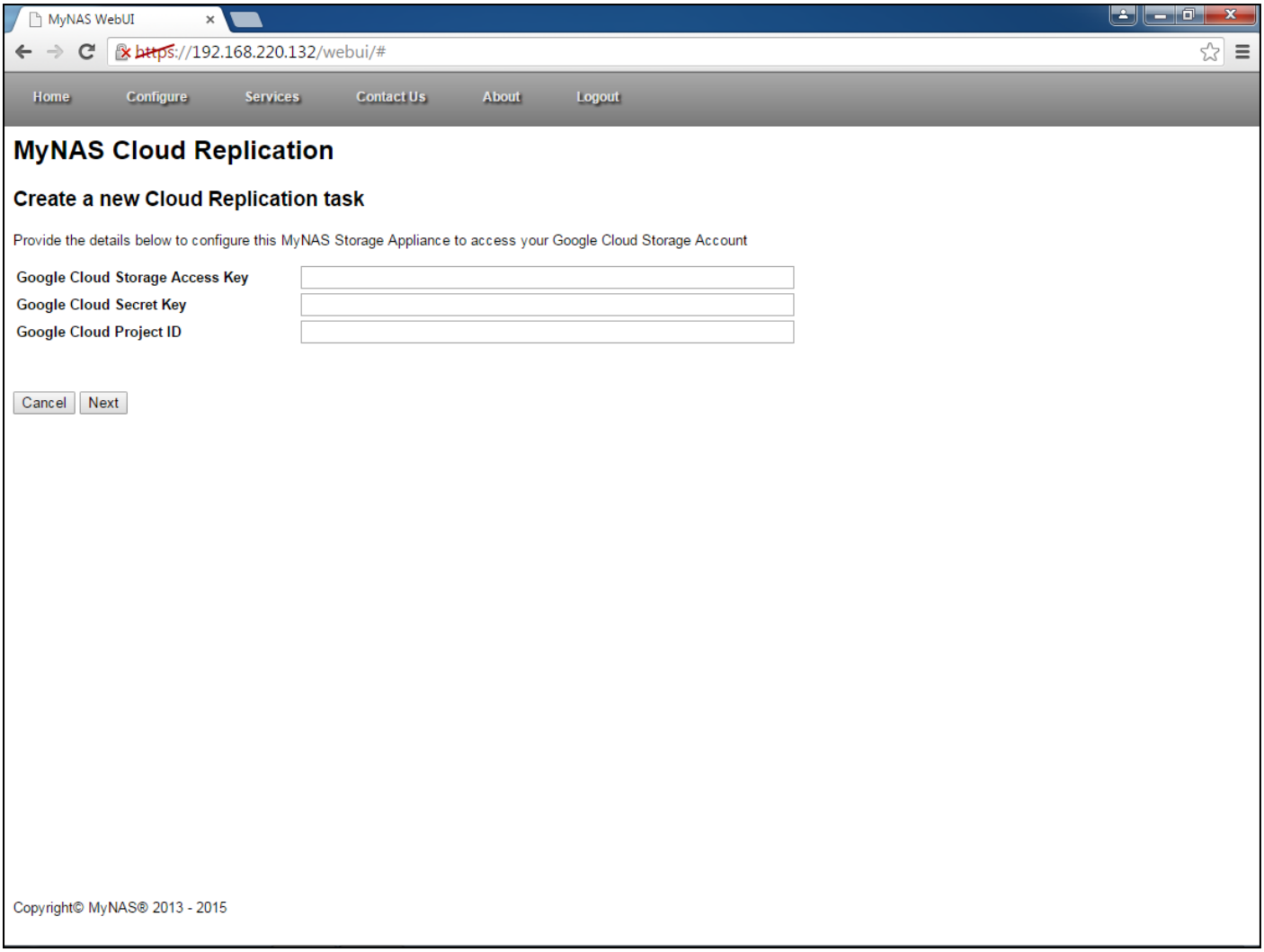
Google Cloud Storage

When selecting Google Cloud Storage, if this has not been configured before, the following will be displayed, detailing specific instructions on what is needed to configure this Cloud Replication Partner access. On the Google Cloud Platform site, you will need to generate the following:

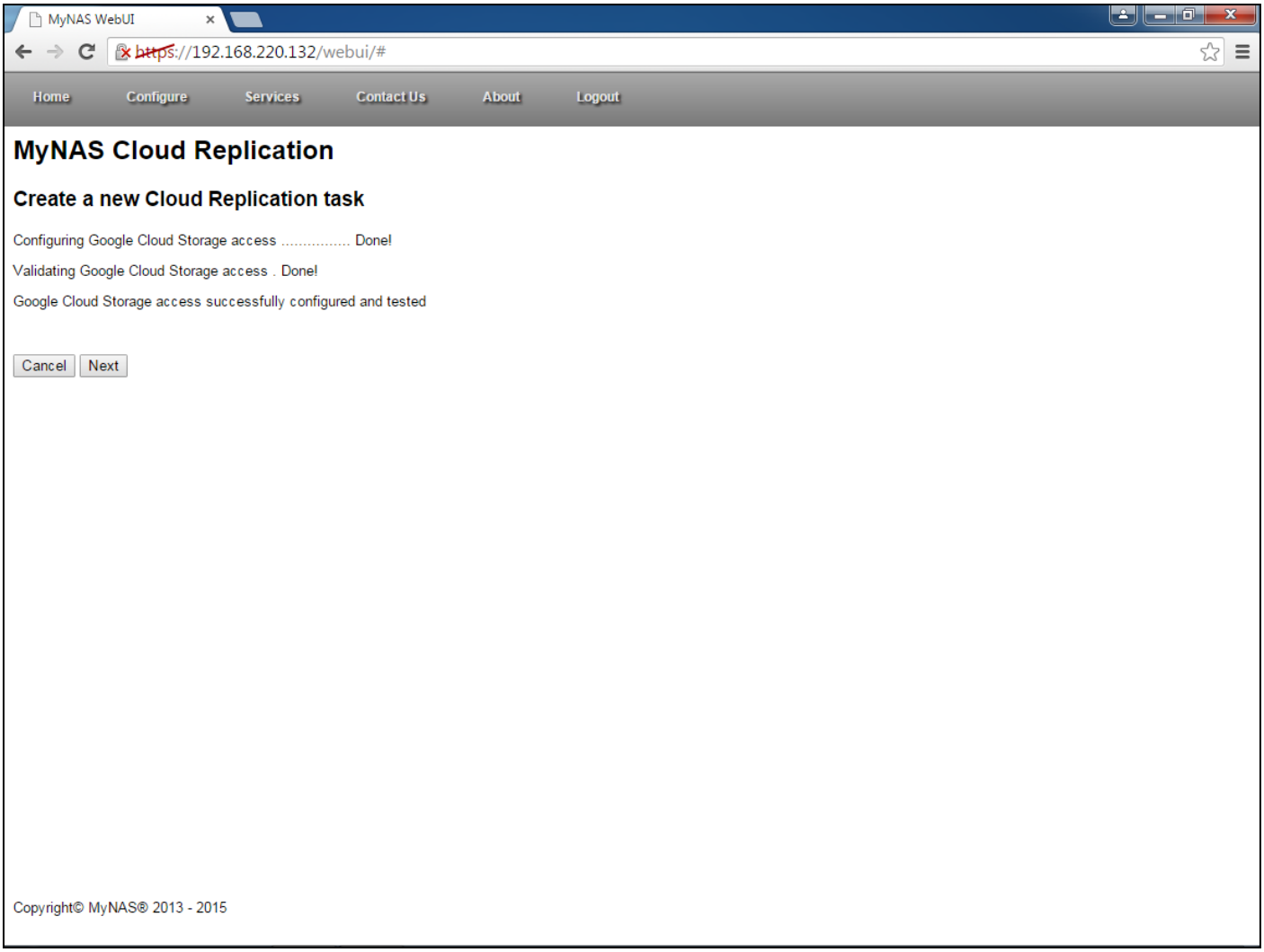
- Project ID
- Access Key
- Secret



Once you have obtained these items, click Next



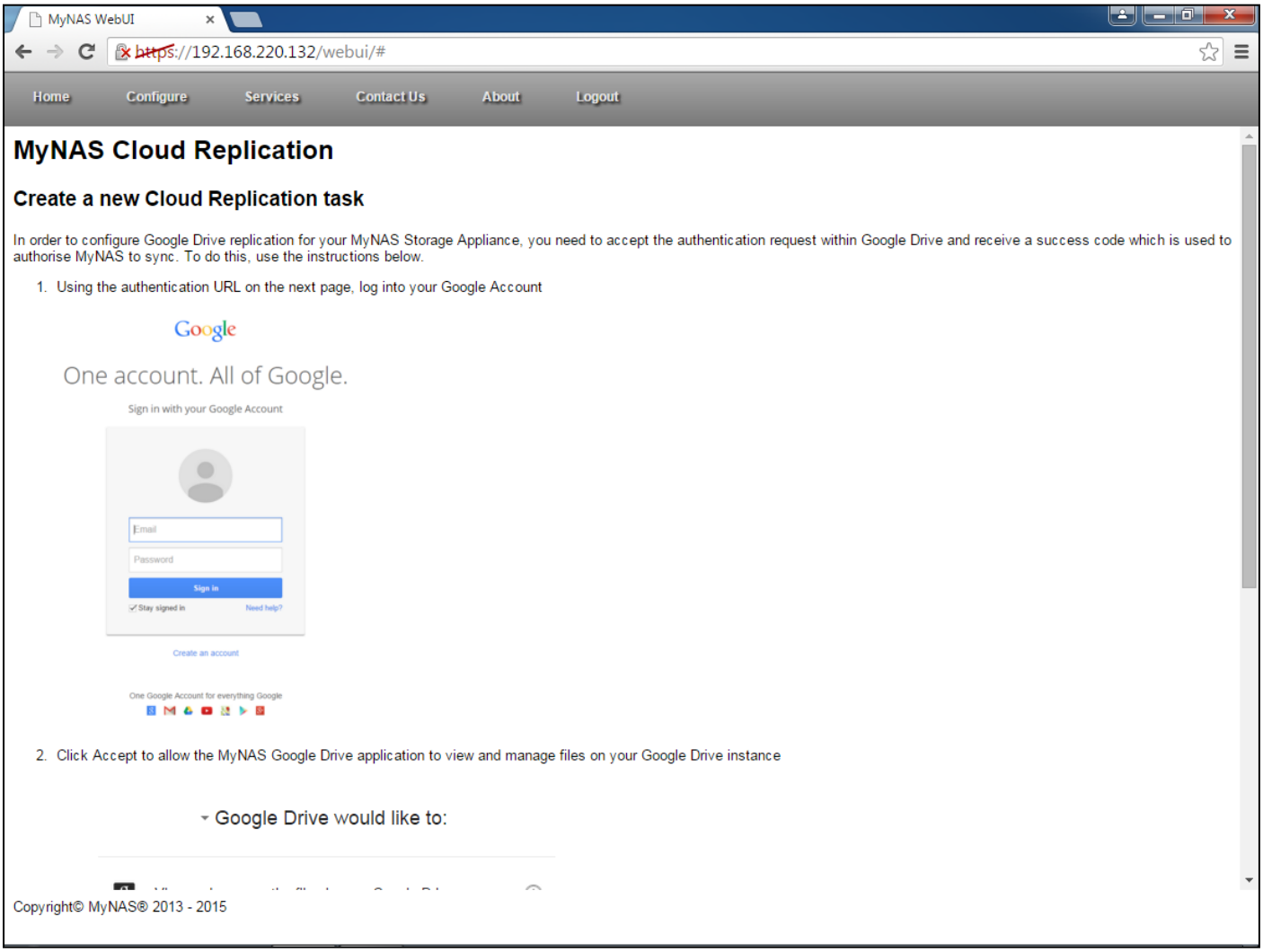
Enter in the required items and click Next



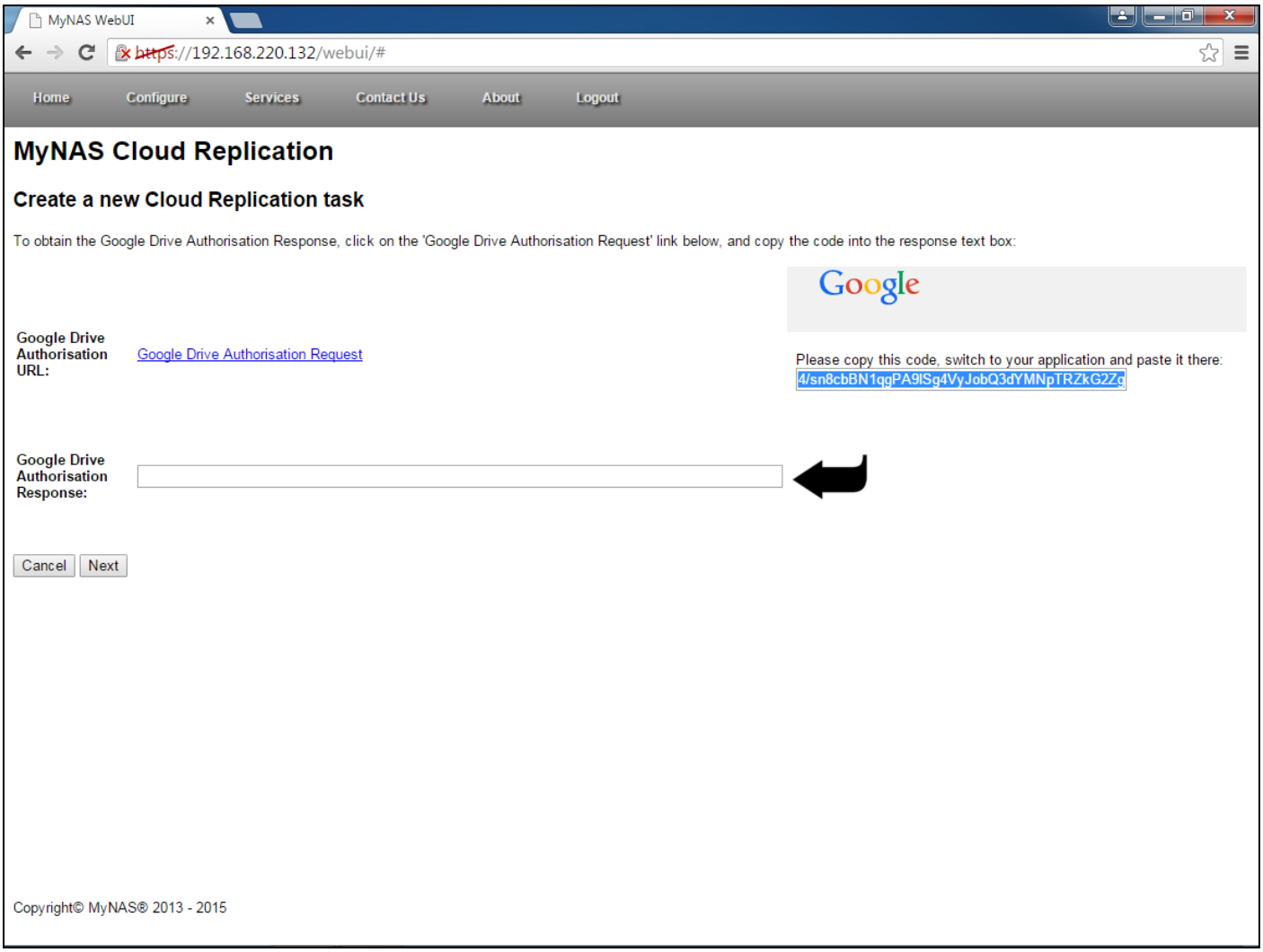
MyNAS will now configure the access to the Google Cloud Storage using the credential information provided. Once configured, click Next

Google Drive

When selecting Google Drive, if this has not been configured before, the following will be displayed, detailing specific instructions on what is needed to configure this Cloud Replication Partner access.

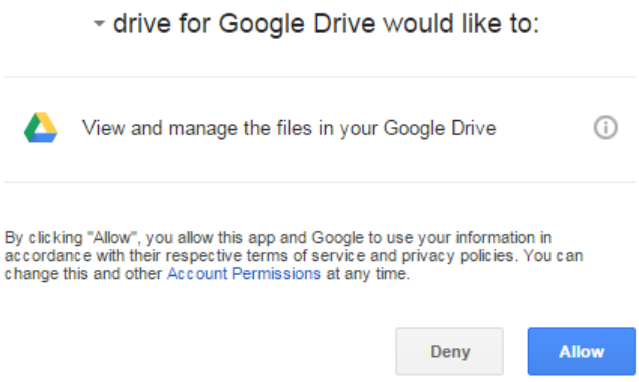


Click Next to begin the setup procedure for Google Drive



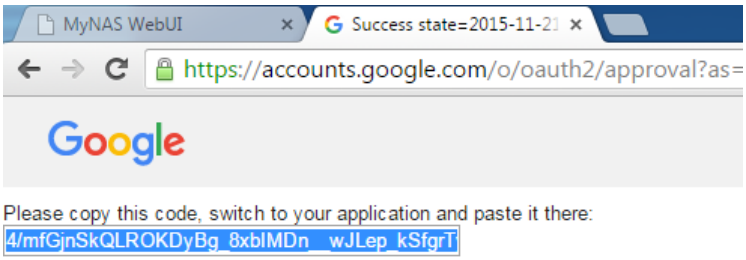
Follow the directions below:

1. Click on the Google Drive Authorisation Request, which will open a new browser window requesting you to login to your Google account
2. Once you authenticate to your Google account, the following will be displayed:

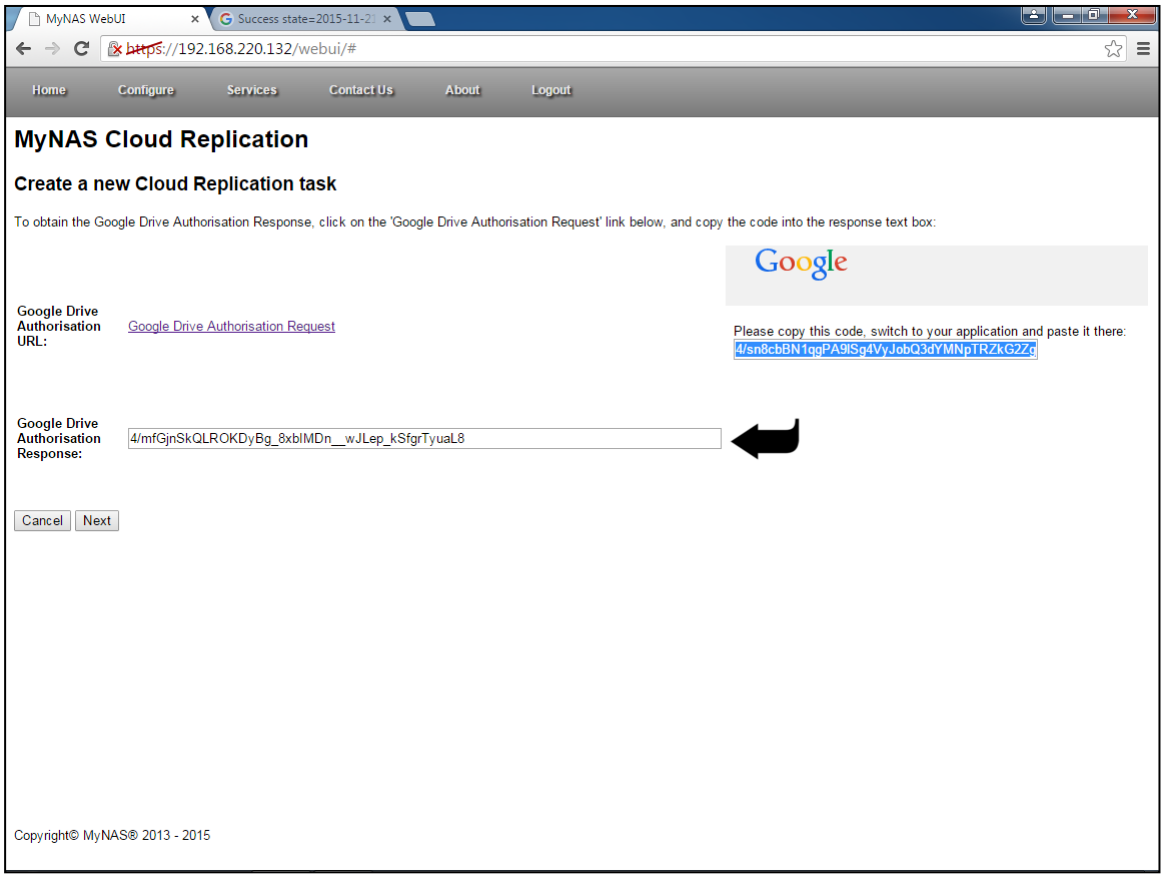


Click the 'Allow' button

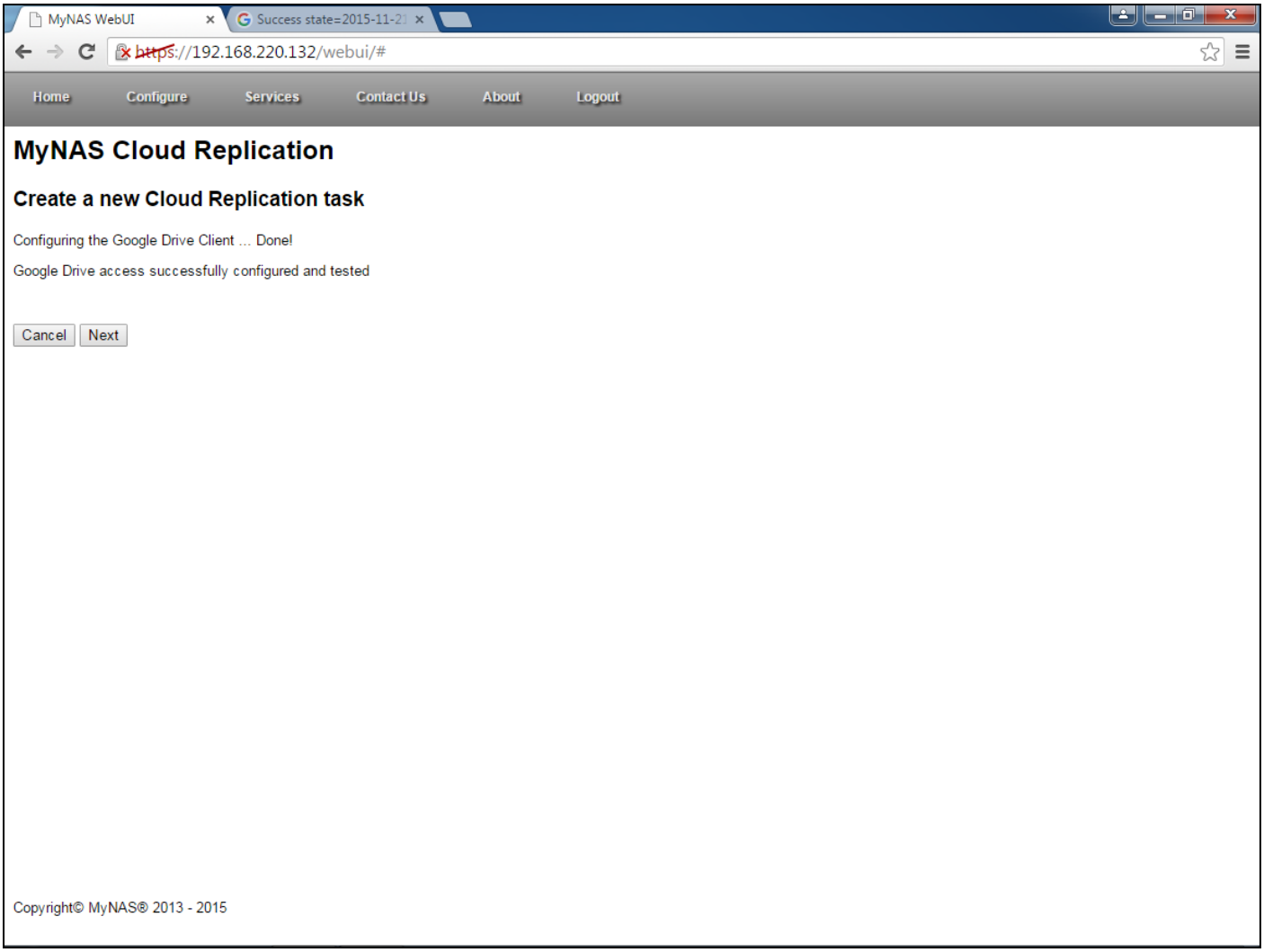
3. Copy the presented code so that this can be used in the MyNAS Storage Appliance configuration wizard



4. Switch back to the MyNAS Storage Appliance configuration wizard and paste the response code where required



Click Next to continue

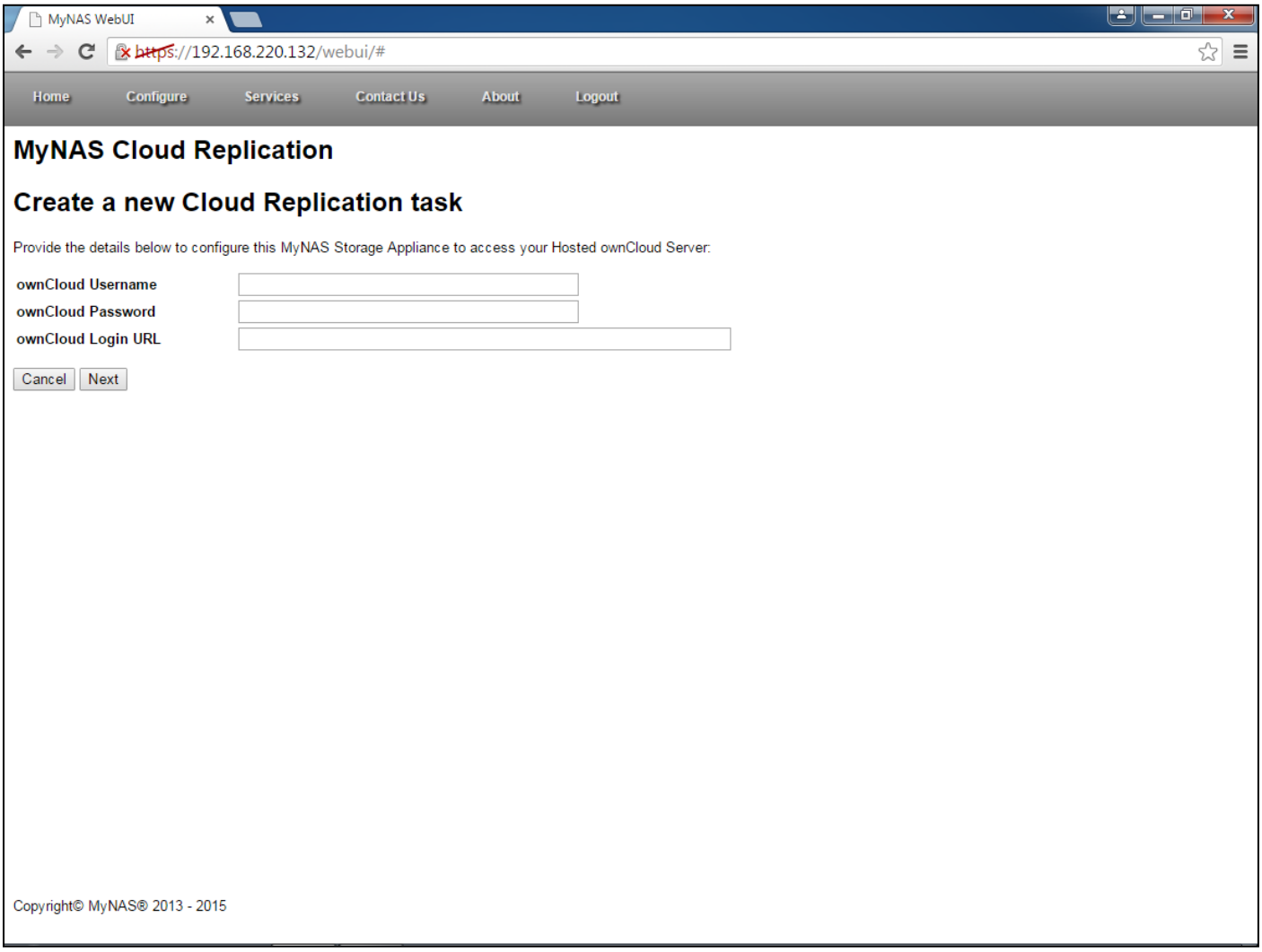


MyNAS Storage Appliance will now configure the Google Drive Client using the response code provided. Click Next to continue

ownCloud Server

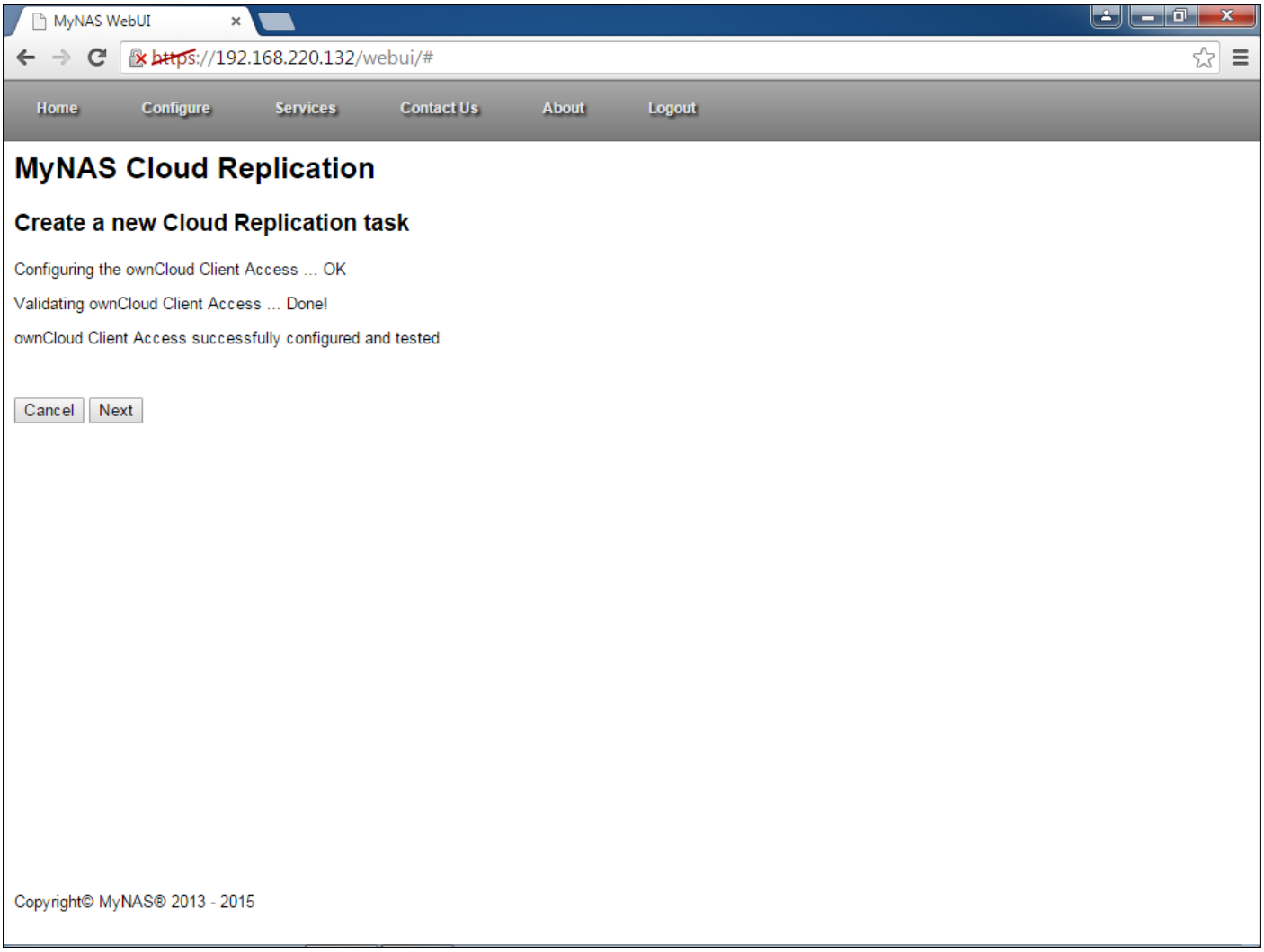
When selecting an ownCloud Server for Cloud Replication, the following will be displayed, detailing specific instructions on what is needed to configure this Cloud Replication Partner access. Due to how the ownCloud Server client operates, this configuration option will be presented each time, for each replication task being configured.

A list of ownCloud Server provides can be found here: https://owncloud.org/providers/



Using the credentials provided when signing up for the ownCloud service, enter in your ownCloud username and password together with the ownCloud URL to access the service.

Once all the required details are entered, click Next

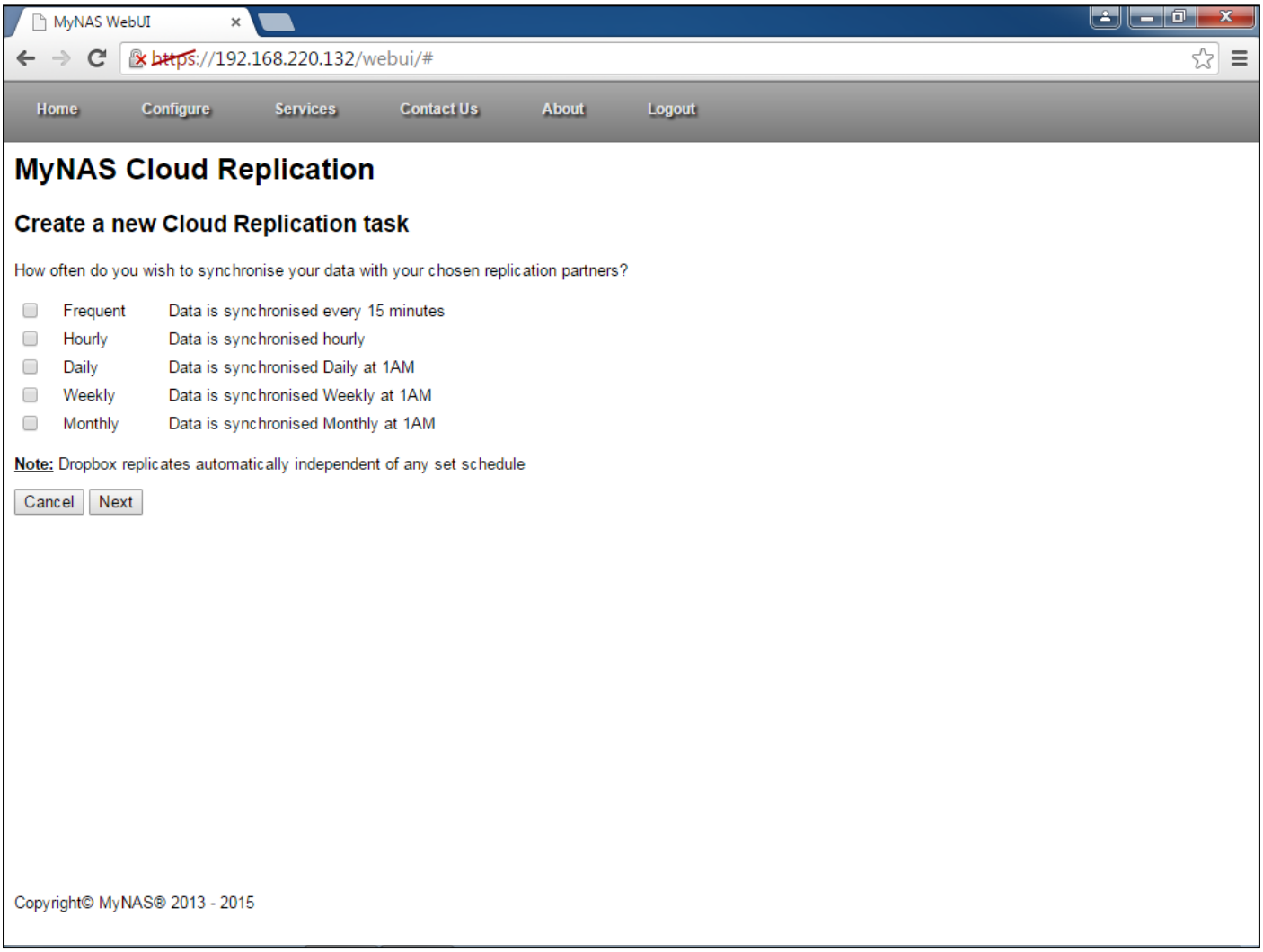


MyNAS will now validate the access to the ownCloud provider and test connectivity. Click Next to continue.

Cloud Replication Frequency

Select the Cloud Replication frequency for this replication task.

Note: As Dropbox synchronises automatically, it is independent of any replication frequency that you select.

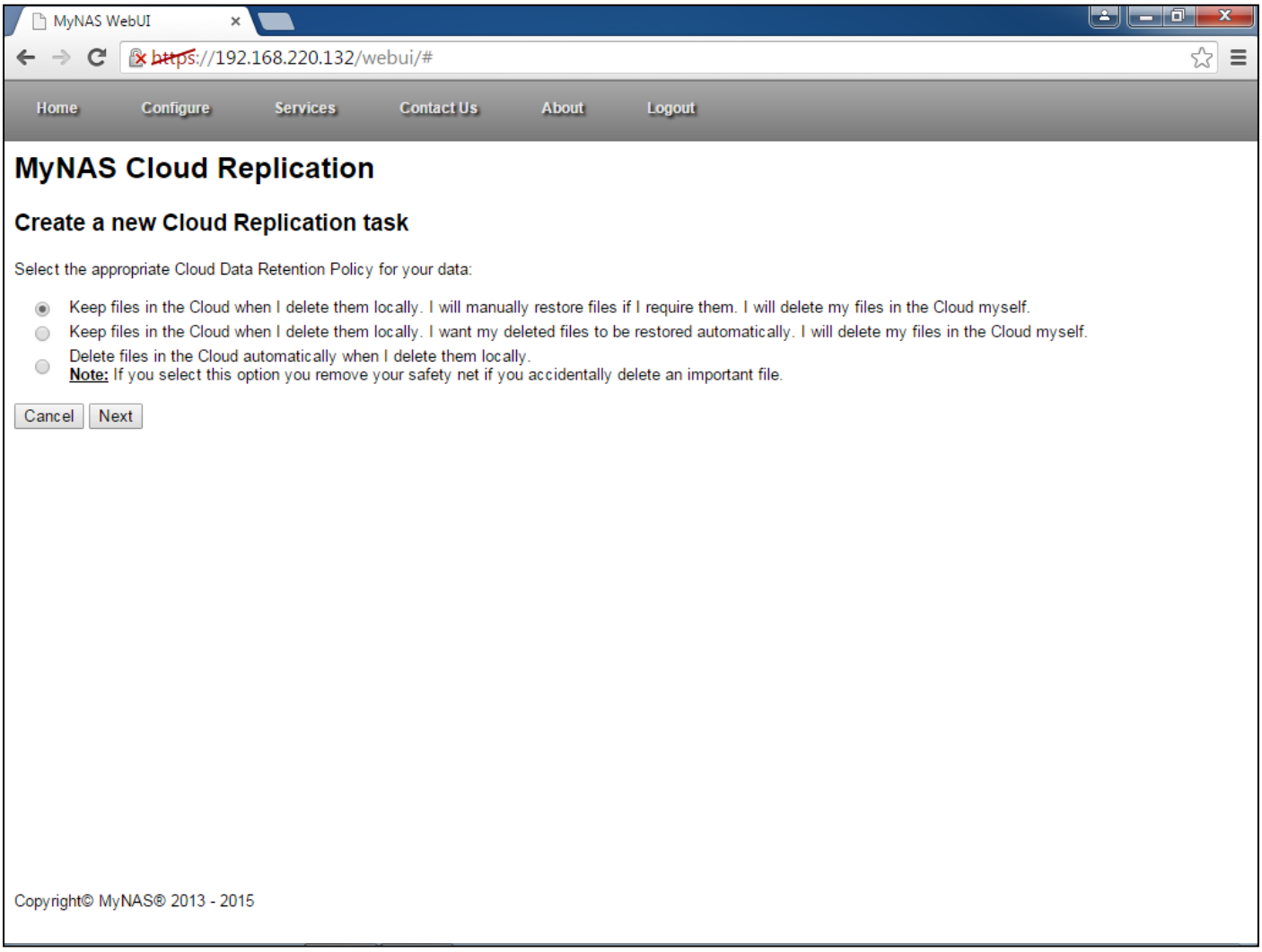


Once the desired replication frequency is selected, click Next.

Cloud Retention Policy

When selecting AmazonS3, Google Cloud Storage and Google Drive, MyNAS Storage Appliance has the capability to utilise Cloud Retention Policies.

These policies allow you to have these Cloud Replication Targets provide the capability to restore your data if you accidentally delete an important file.

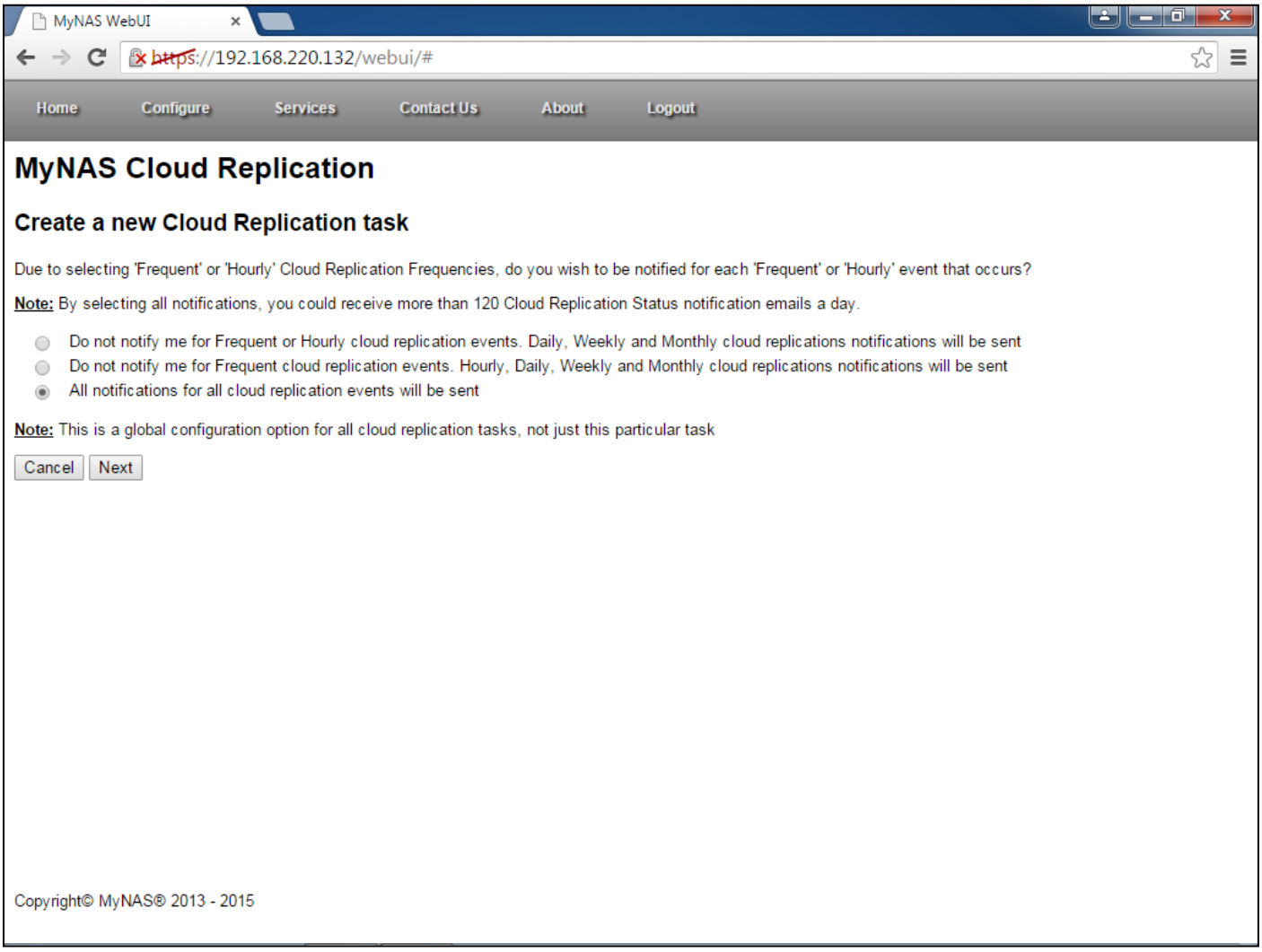


Once a retention policy has been selected, click Next

Cloud Replication Notifications

When a replication task occurs, you will be notified of the actions taken on your data, together with any failures or errors.

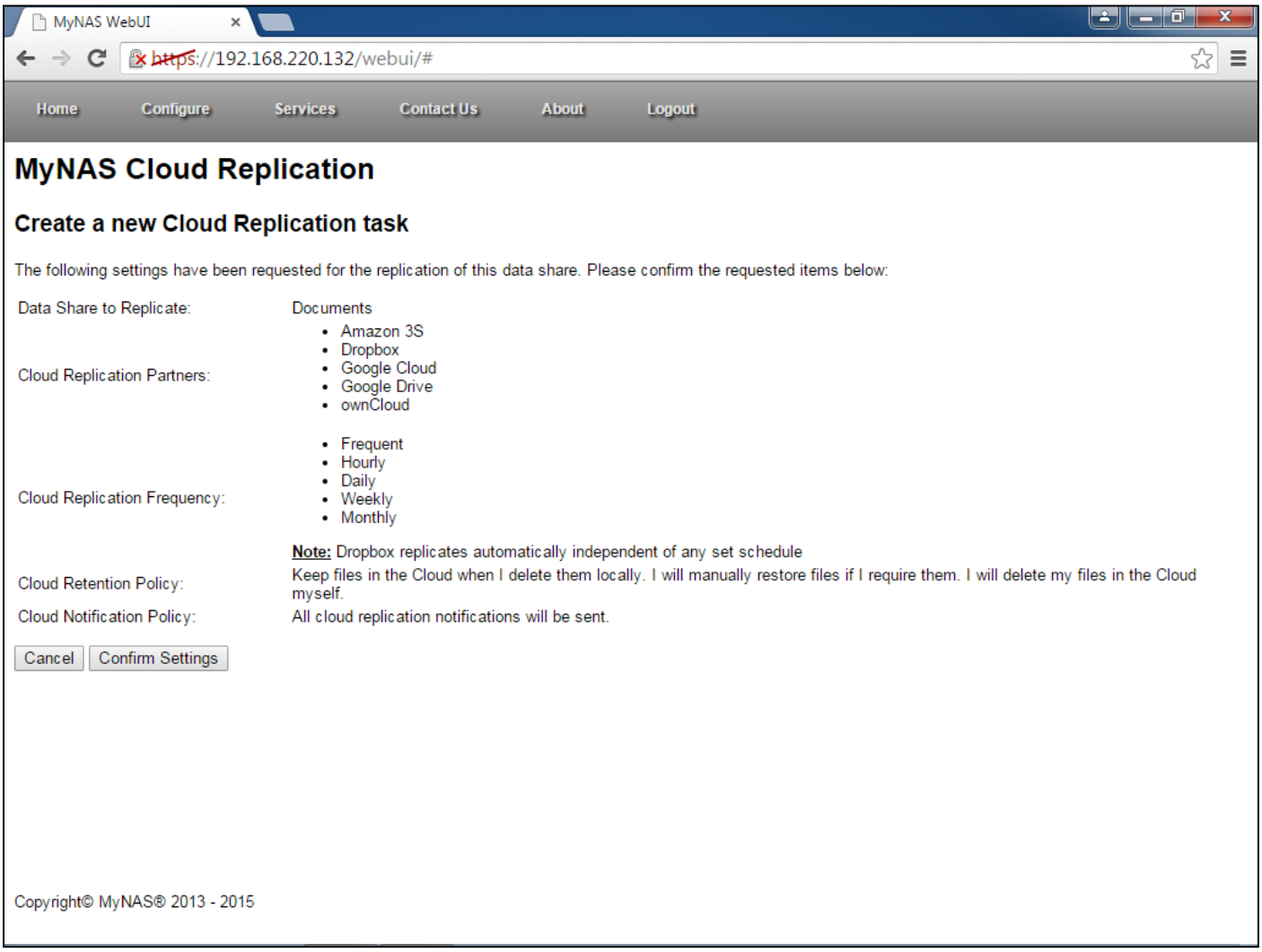
Depending on the frequency selected, this could generate a significant number of messages per day. Select the appropriate notification frequency for you for all Cloud Replication Tasks



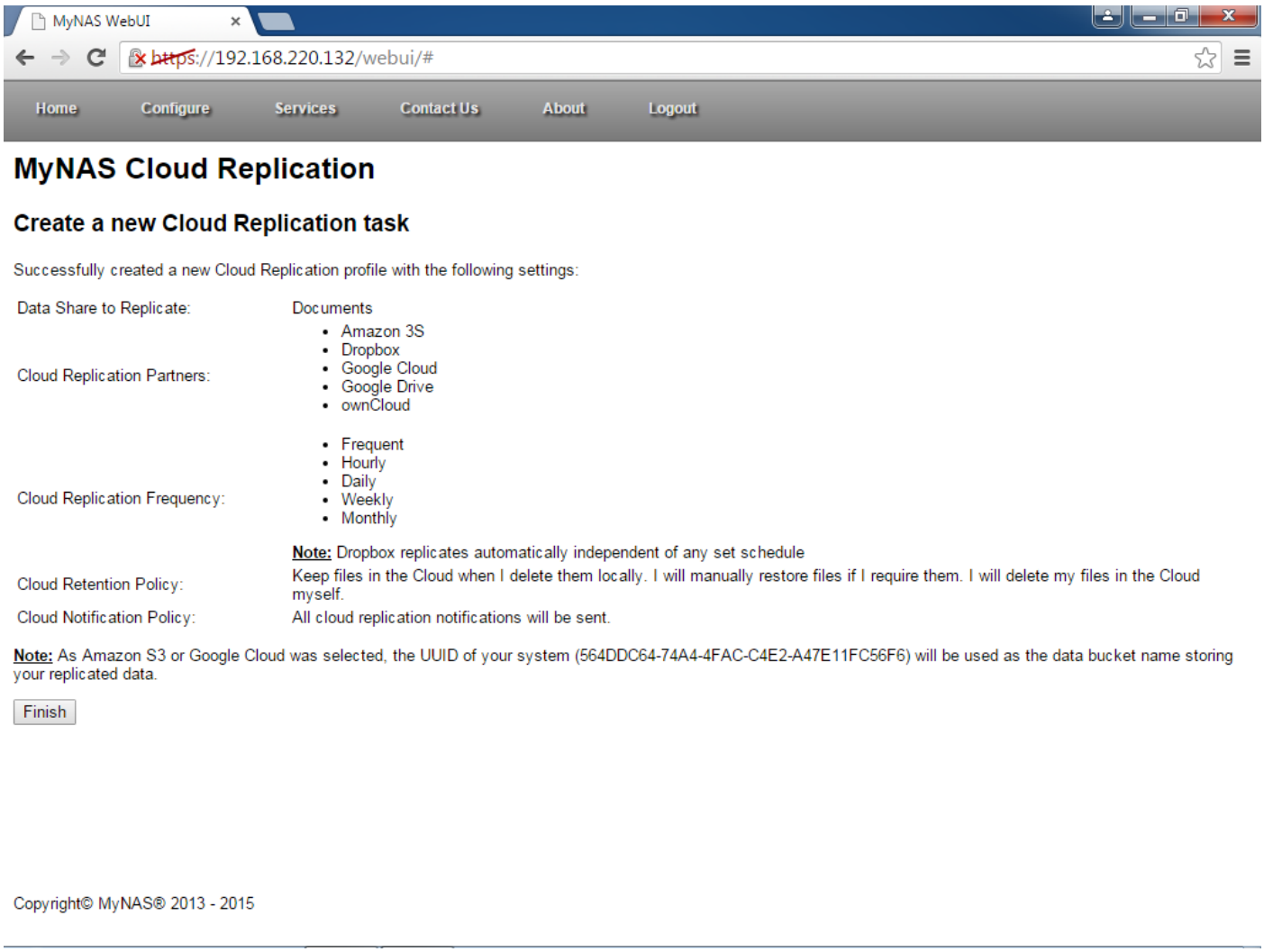
Once the notification policy has been set, click Next.

Confirmation of settings and Completion of task

Confirm all the requested options selected for this Cloud Replication Task



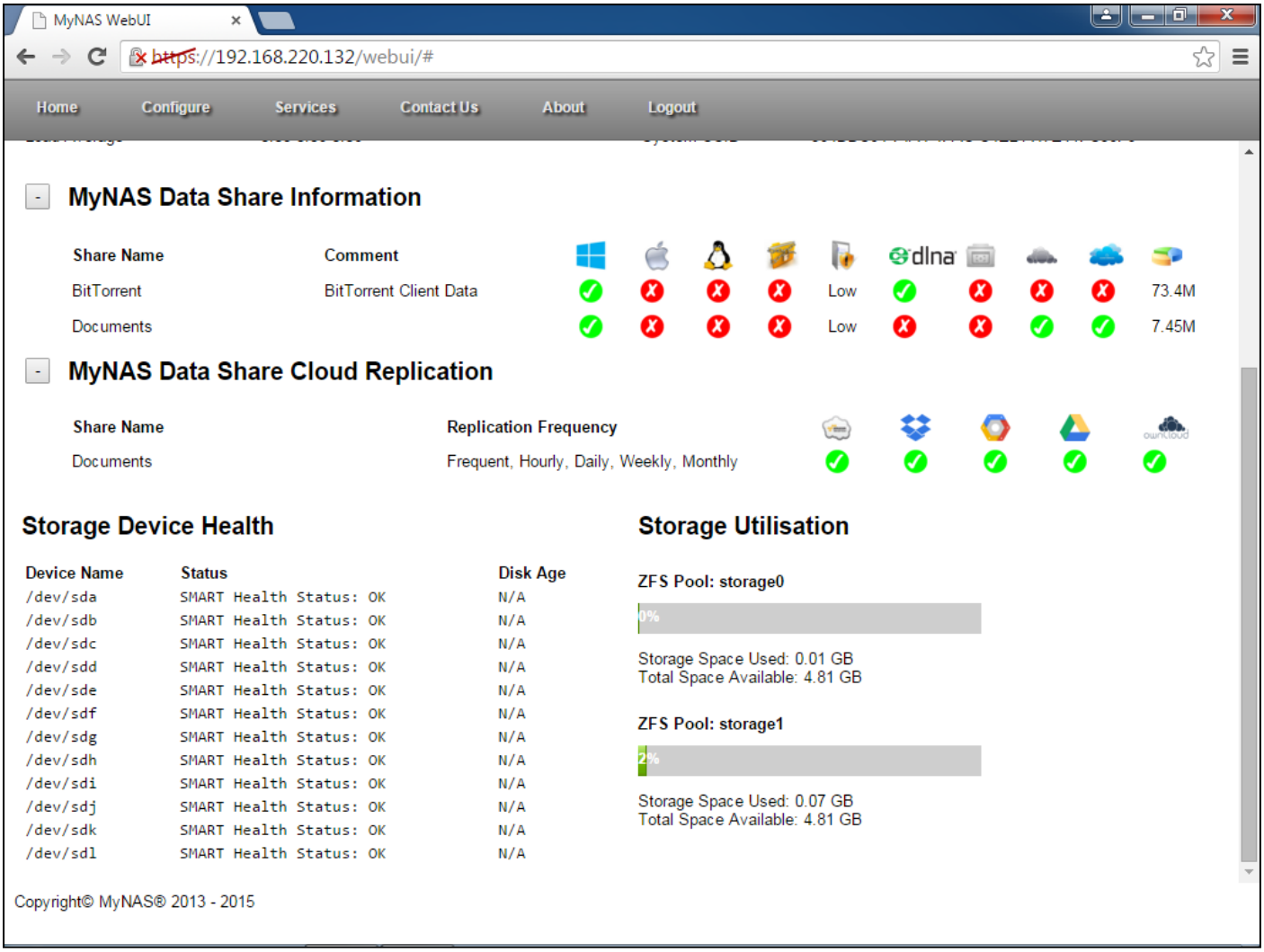
If all the settings are correct, click 'Confirm Settings' to save the settings



The Cloud Replication settings are now saved. Based on the replication frequency selected, the replication will begin at the next replication window. Click 'Finish' to close the wizard.

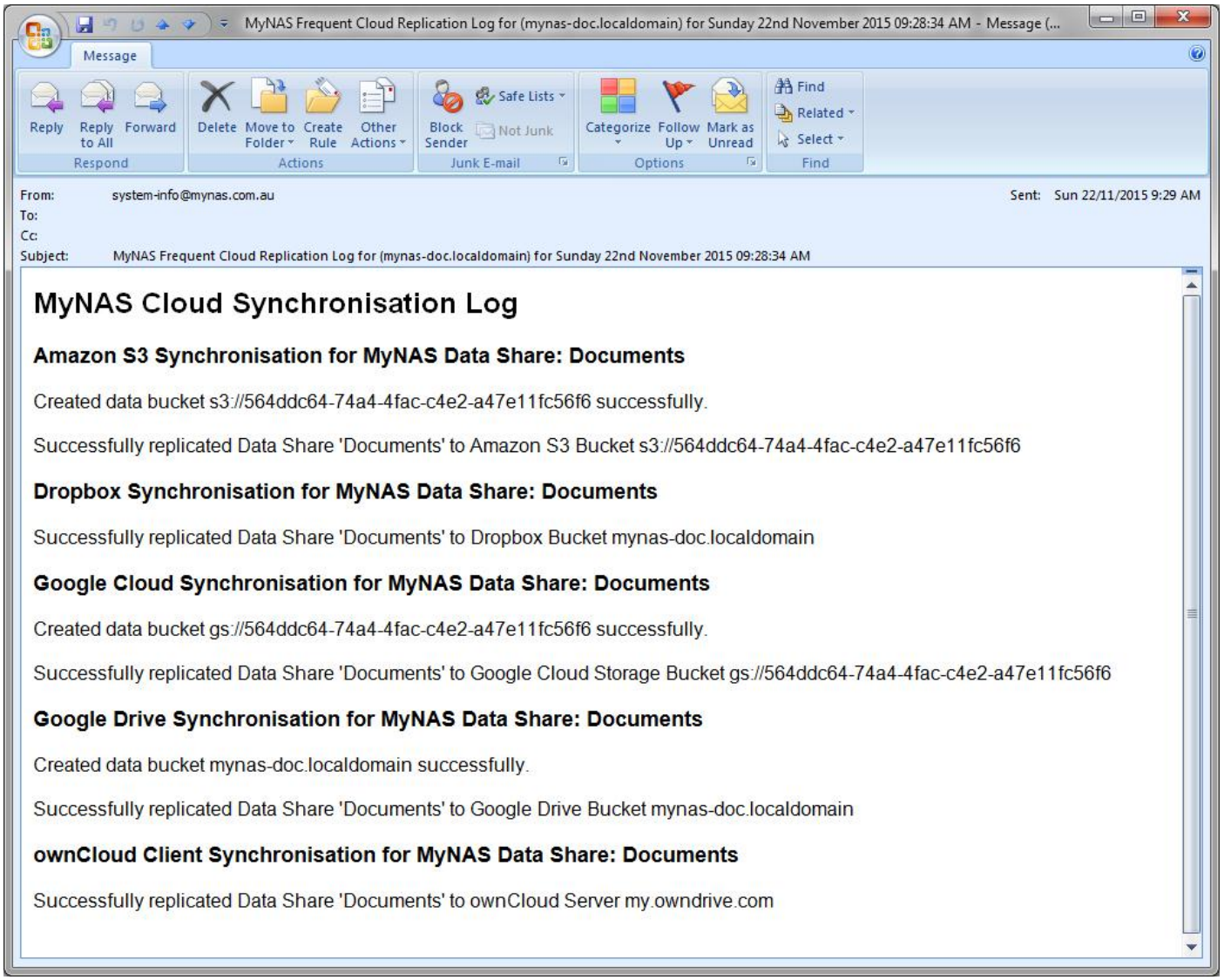
Note: Depending on the size of data in the Data Share, the initial synchronisation to your selected replication partners may take some time to complete.

On the MyNAS Storage Appliance Home Page, a snapshot of what is now configured is available



Notification of Completed Cloud Replication

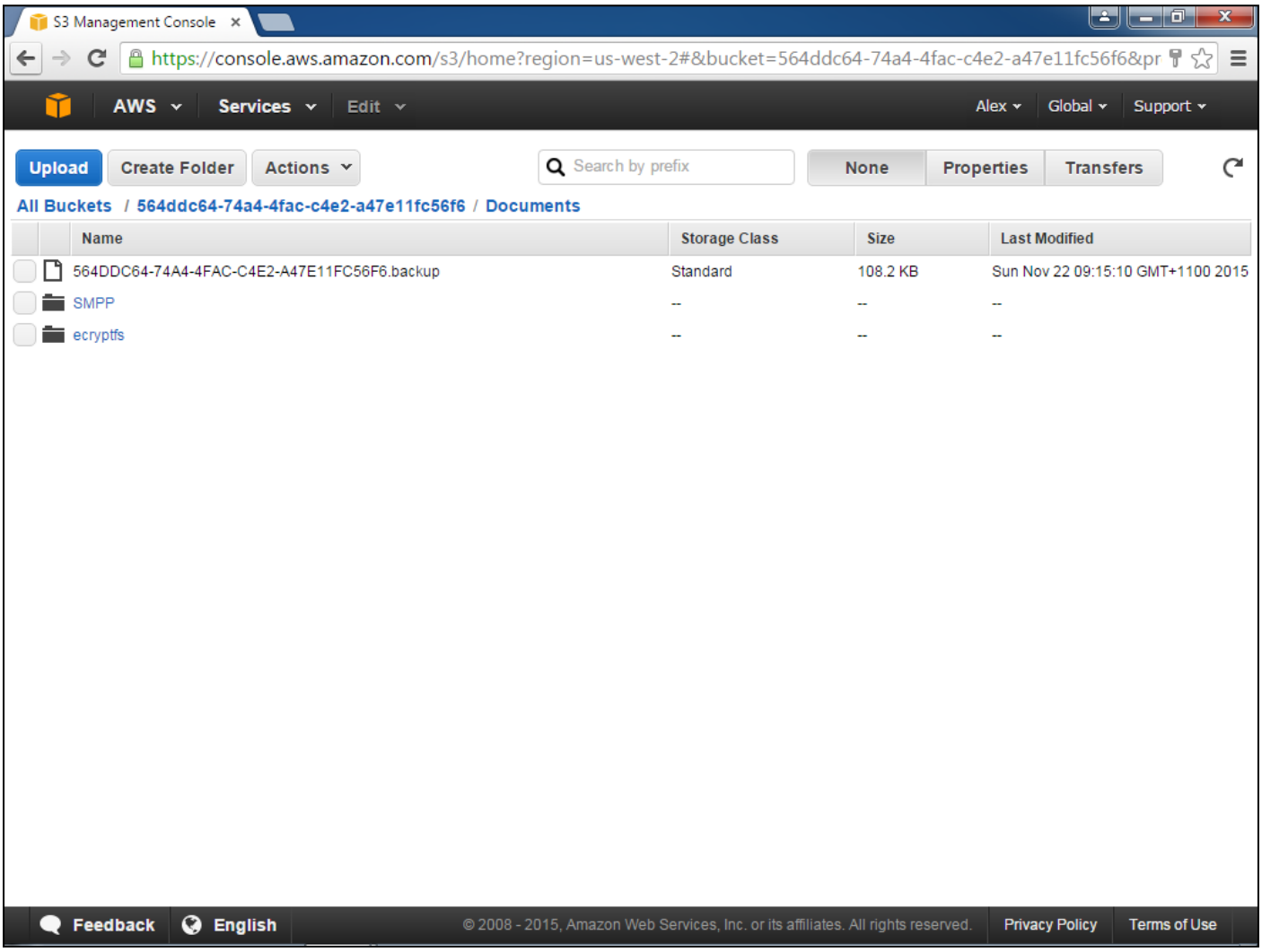
When the initial Cloud Replication task is complete, and depending on the notification frequency selected, the following email will be sent:



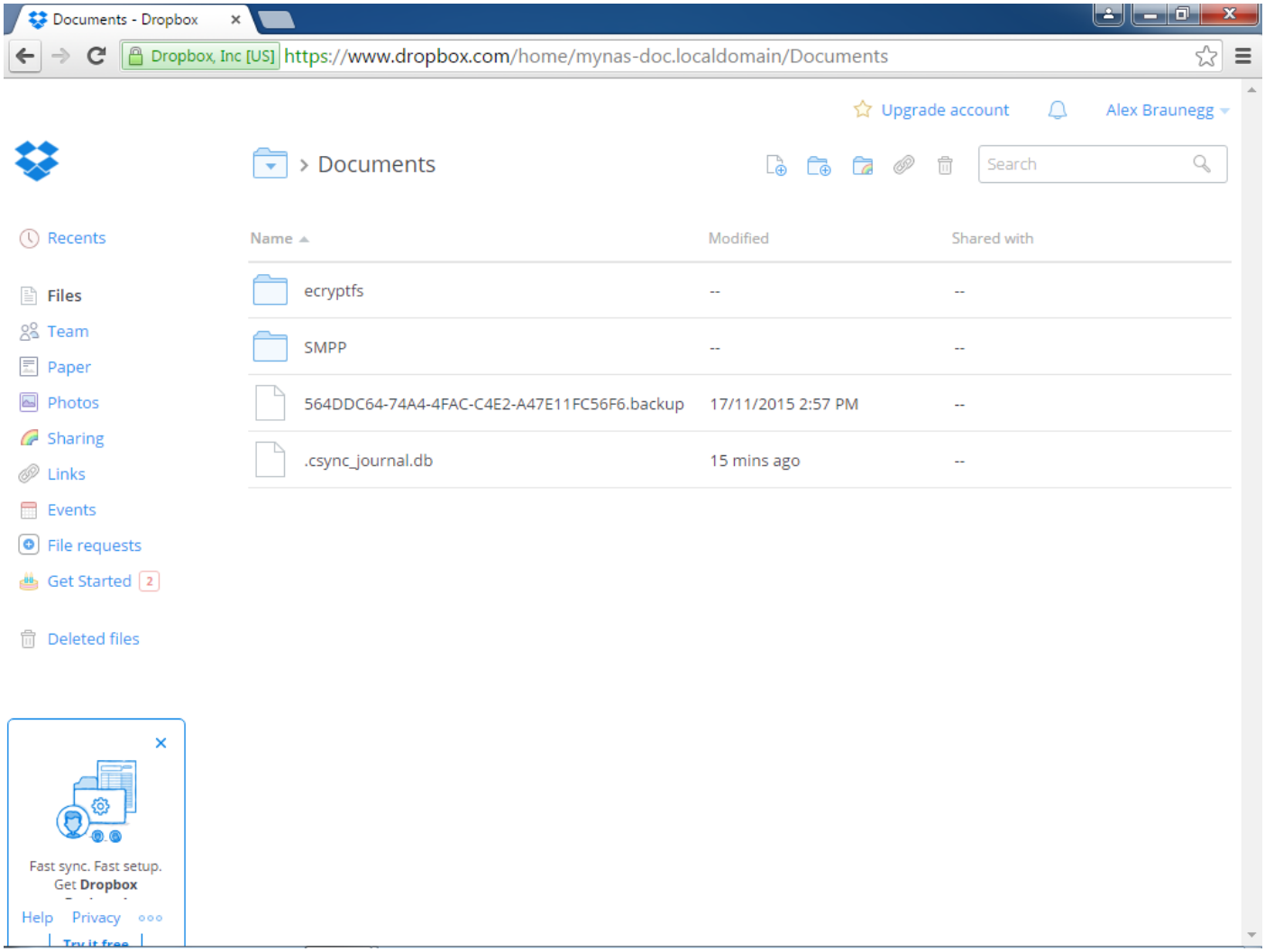
Validating Cloud Replication

To further validate your cloud replication and what data has been replicated, login to each of the Cloud Replication Partners to view your data:

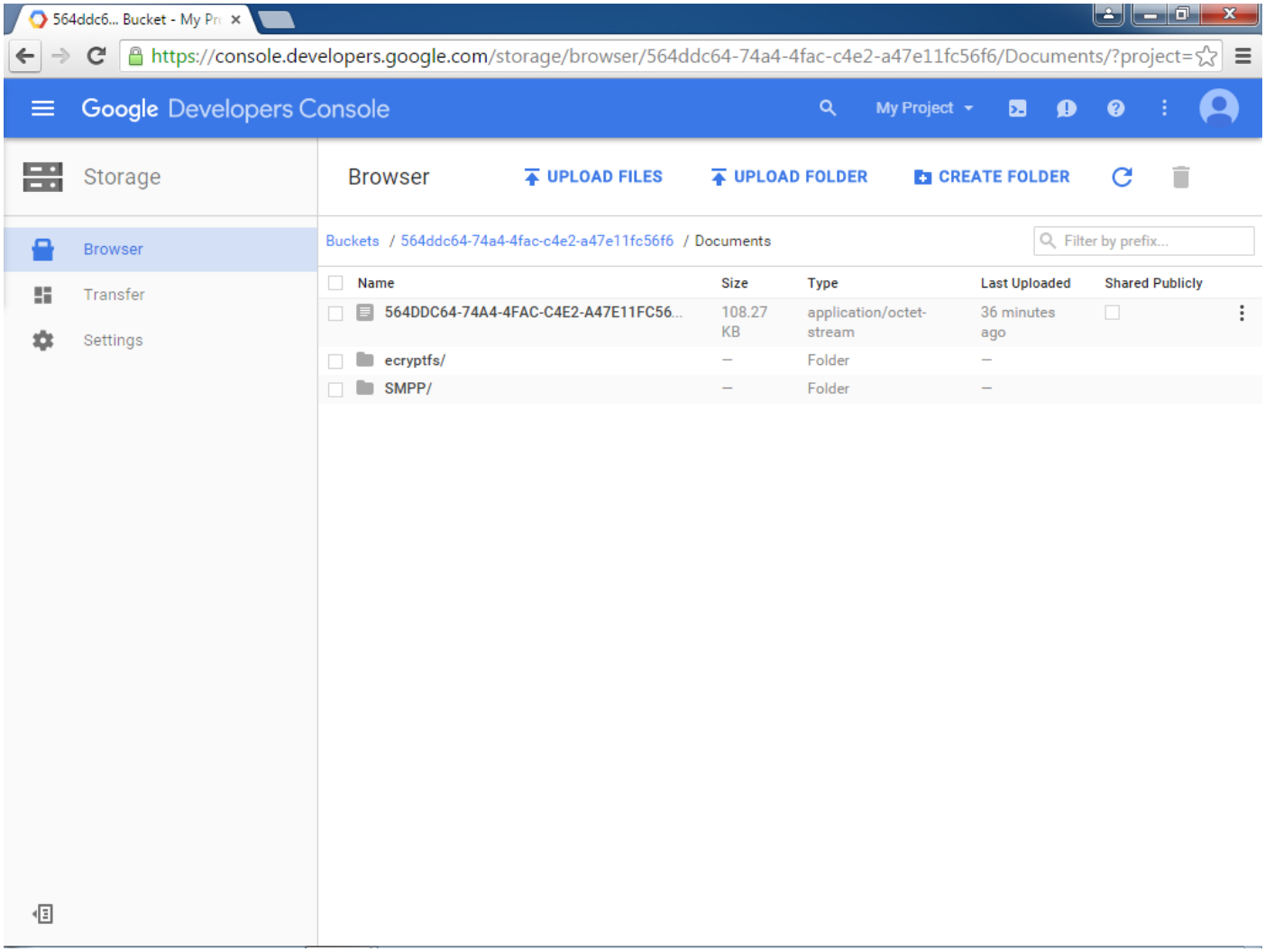
Amazon S3



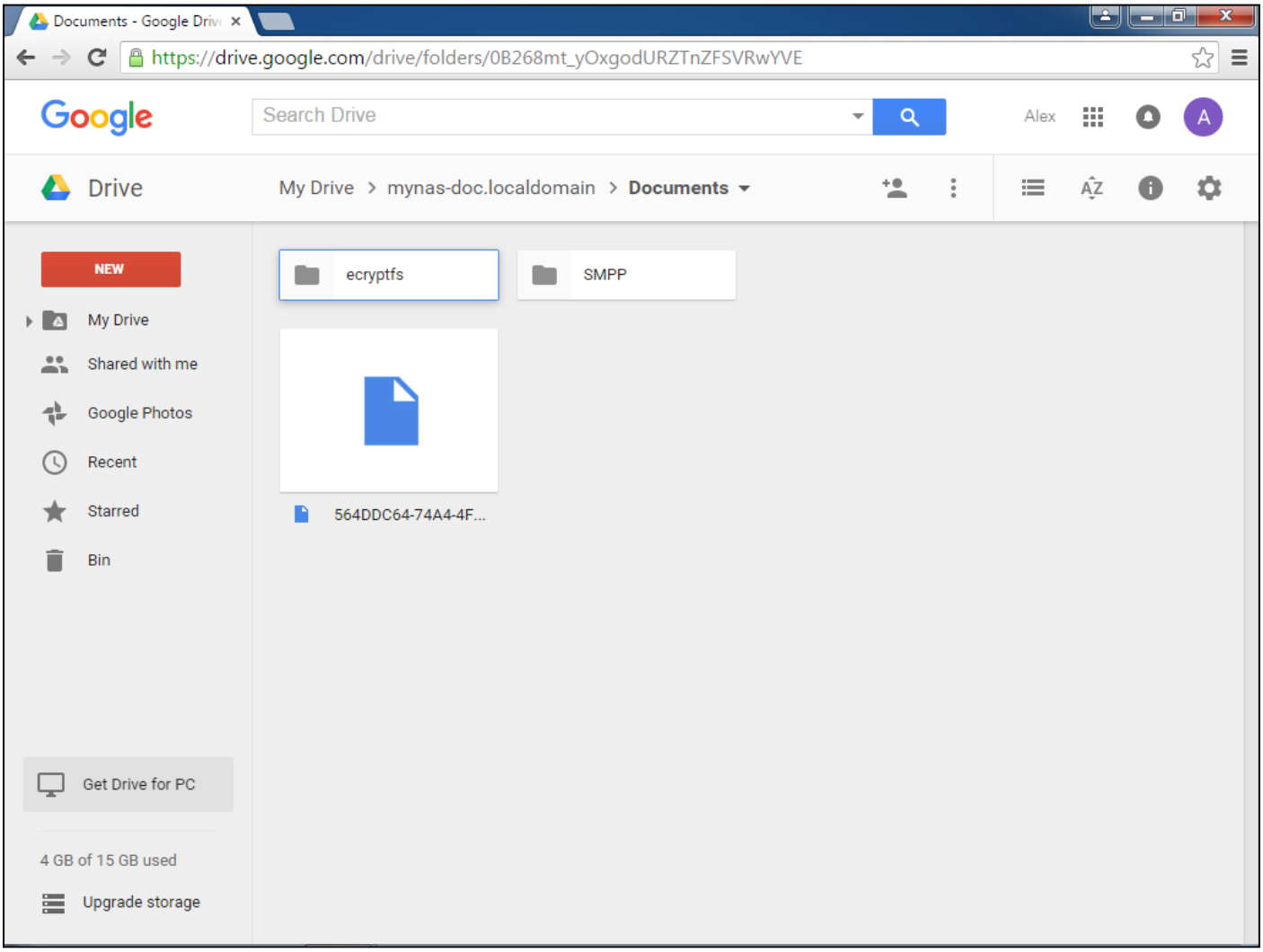
Dropbox


Documents - Dropbox
Dropbox, Inc [US] https://www.dropbox.com/home/mynas-doc.localdomain/Documents
Upgrade account
Alex Braunegg
Documents
Search
Recents
Files
Team
Paper
Photos
Sharing
Links
Events
File requests
Get Started 2
Deleted files
Name
Modified
Shared with
ecryptfs -- --
SMPP -- --
564DDC64-74A4-4FAC-C4E2-A47E11FC56F6.backup 17/11/2015 2:57 PM --
.csync_journal.db 15 mins ago --
Fast sync. Fast setup.
Get Dropbox
Help Privacy

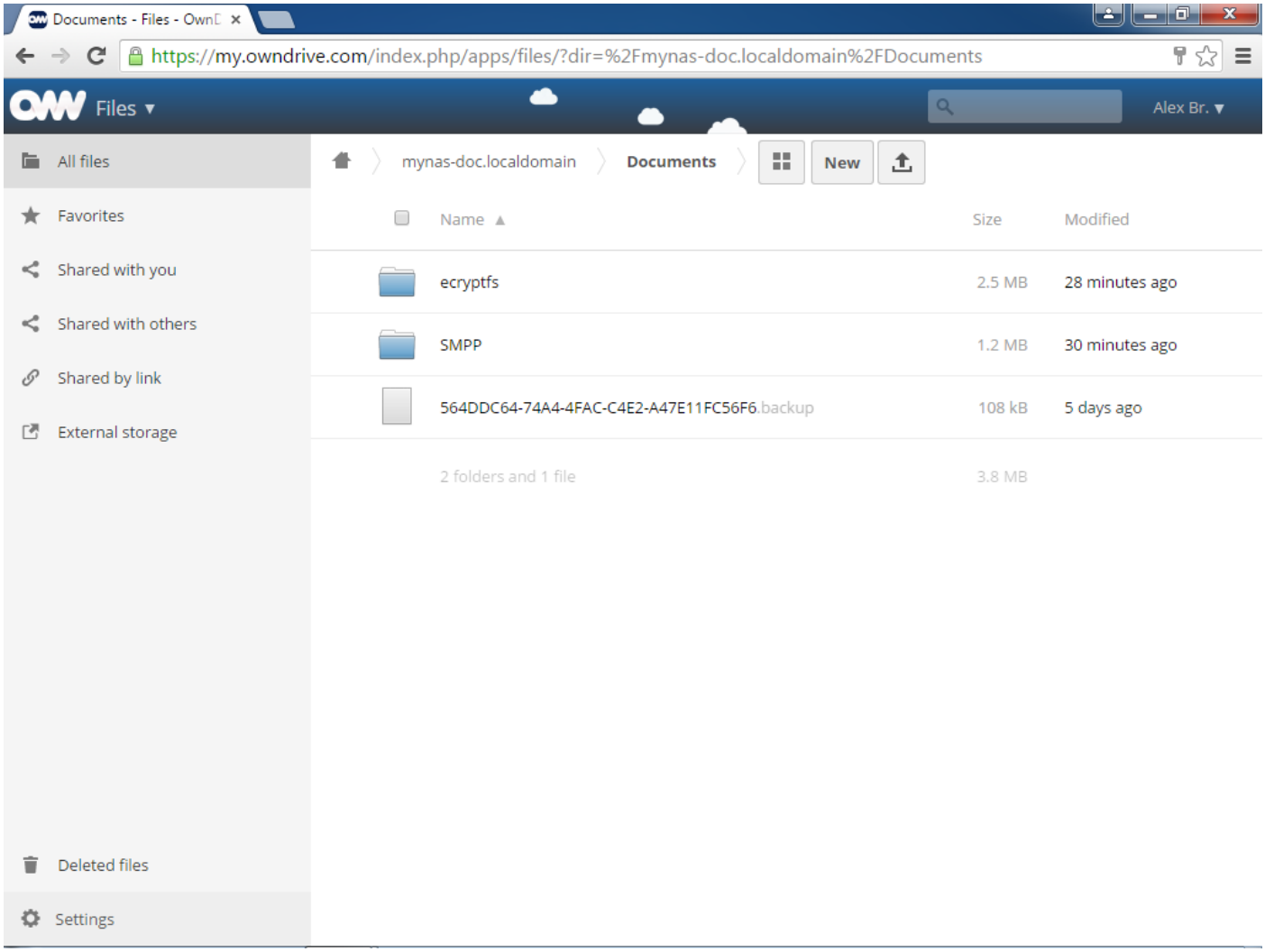
Google Cloud Storage



Google Drive



ownCloud Server - via my provider ownDrive.com

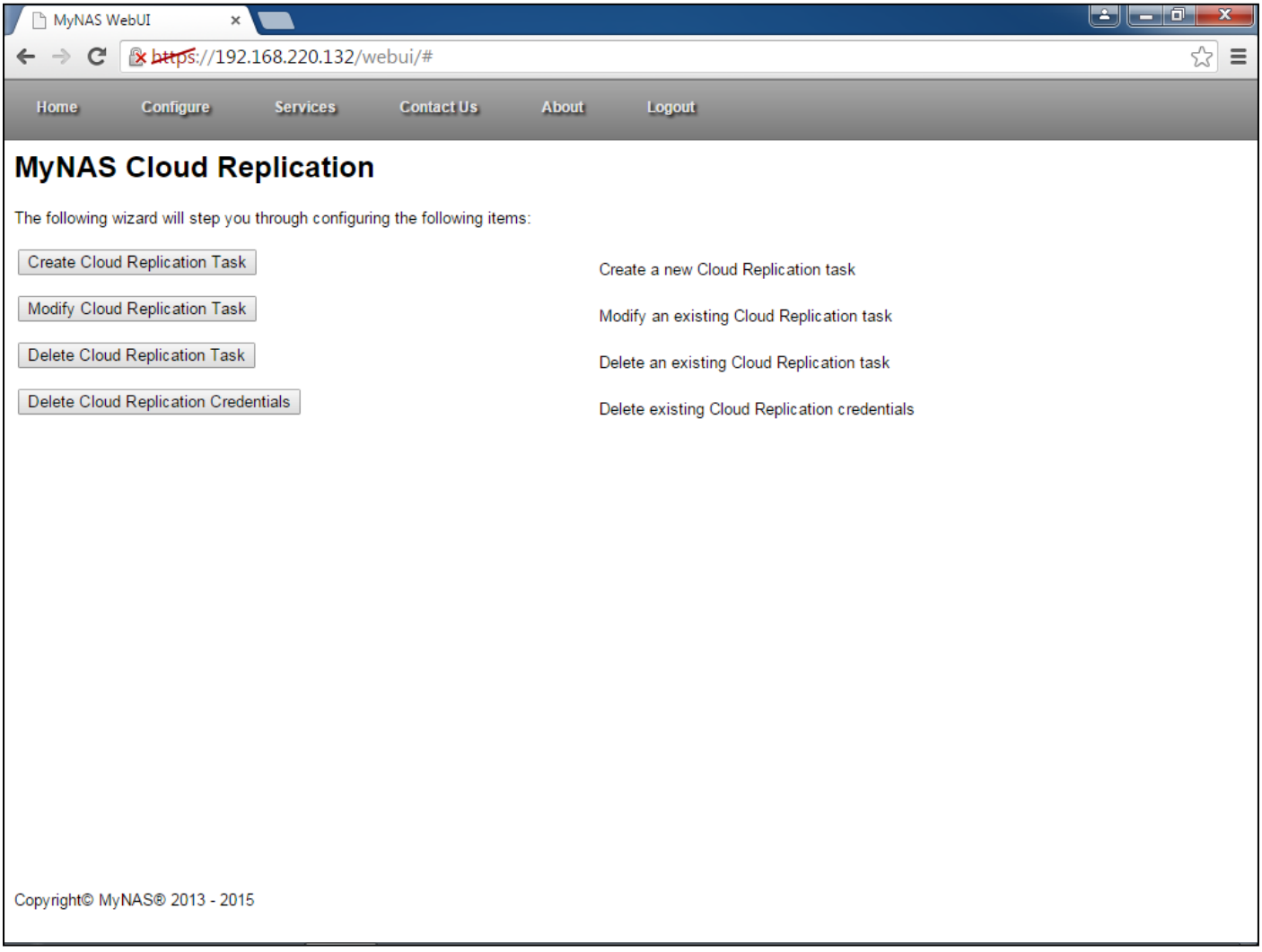


Modify an existing Cloud Replication Task

Modifying an existing Cloud Replication Task allows you to add or remove a replication partner, or change some of the options used when performing the replication.

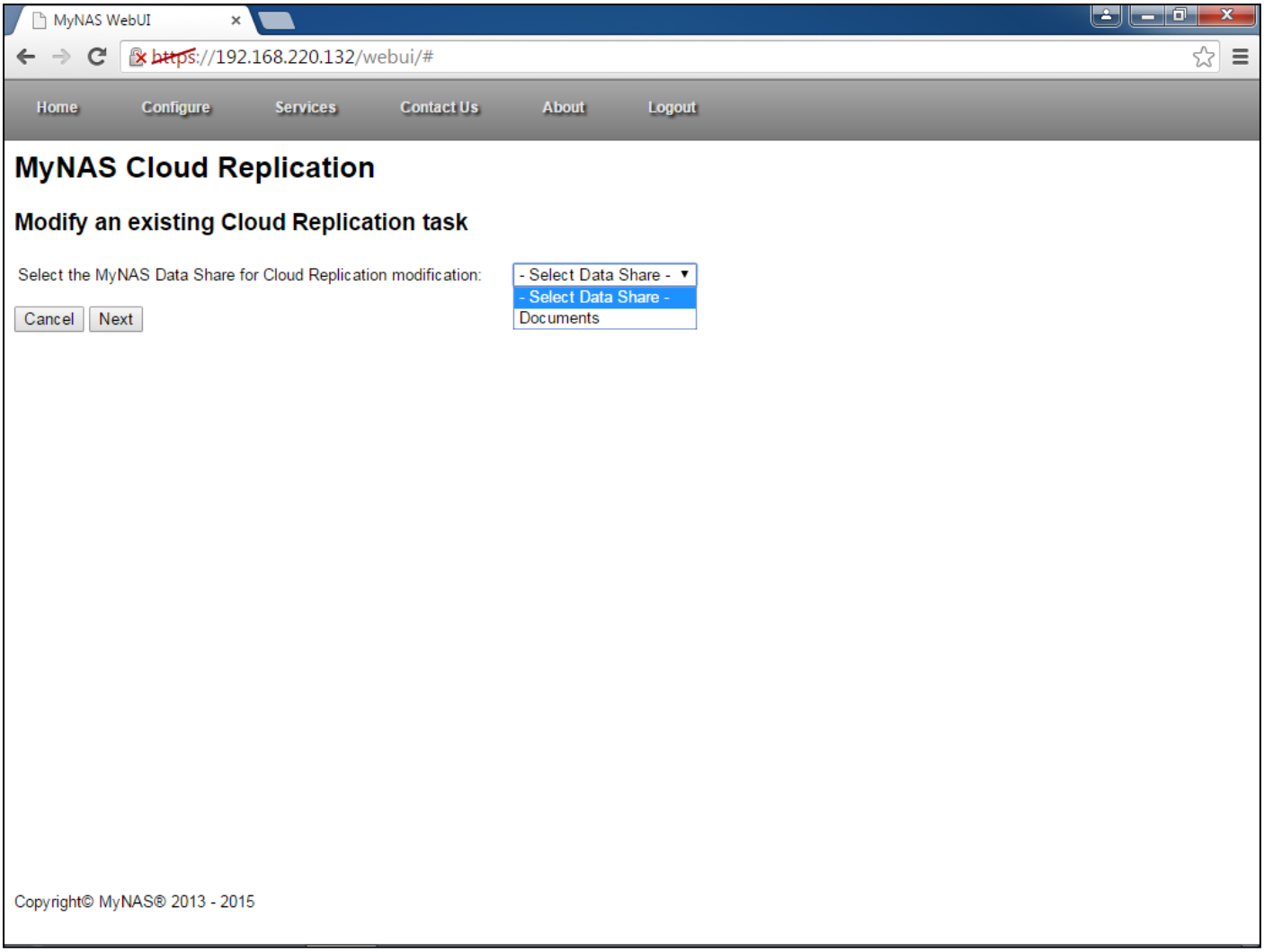
To modify an existing Cloud Replication Task on your MyNAS storage appliance, follow the directions below.

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Cloud Replication'. Once selected, the following will be displayed:



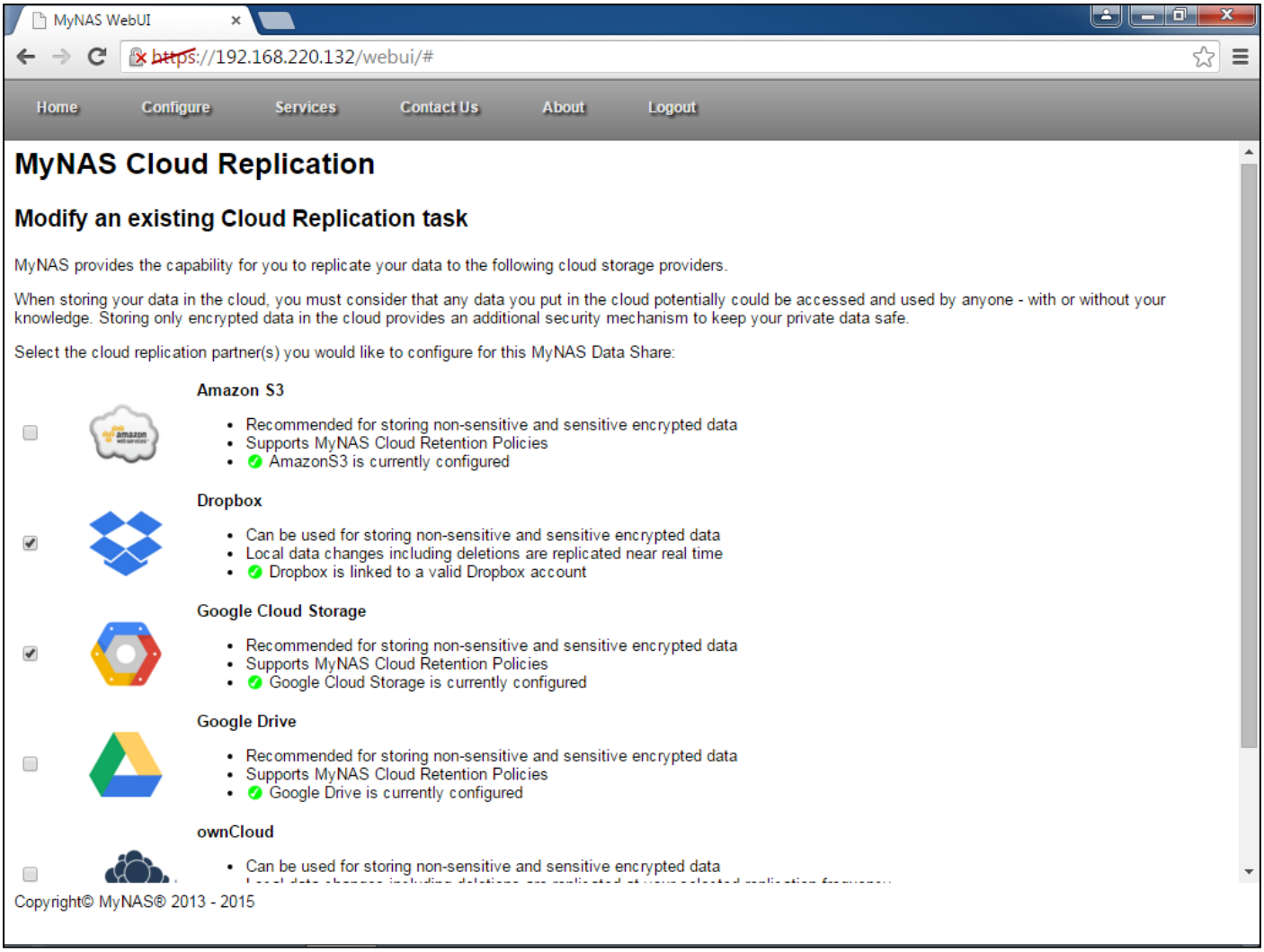
To modify an existing Cloud Replication Task, click the 'Modify Cloud Replication Task' button.

Select the Data Share to modify the Cloud Replication settings for:



Once selected, click 'Next'

Change which Cloud Replication Partners you wish to use for this data share replication:

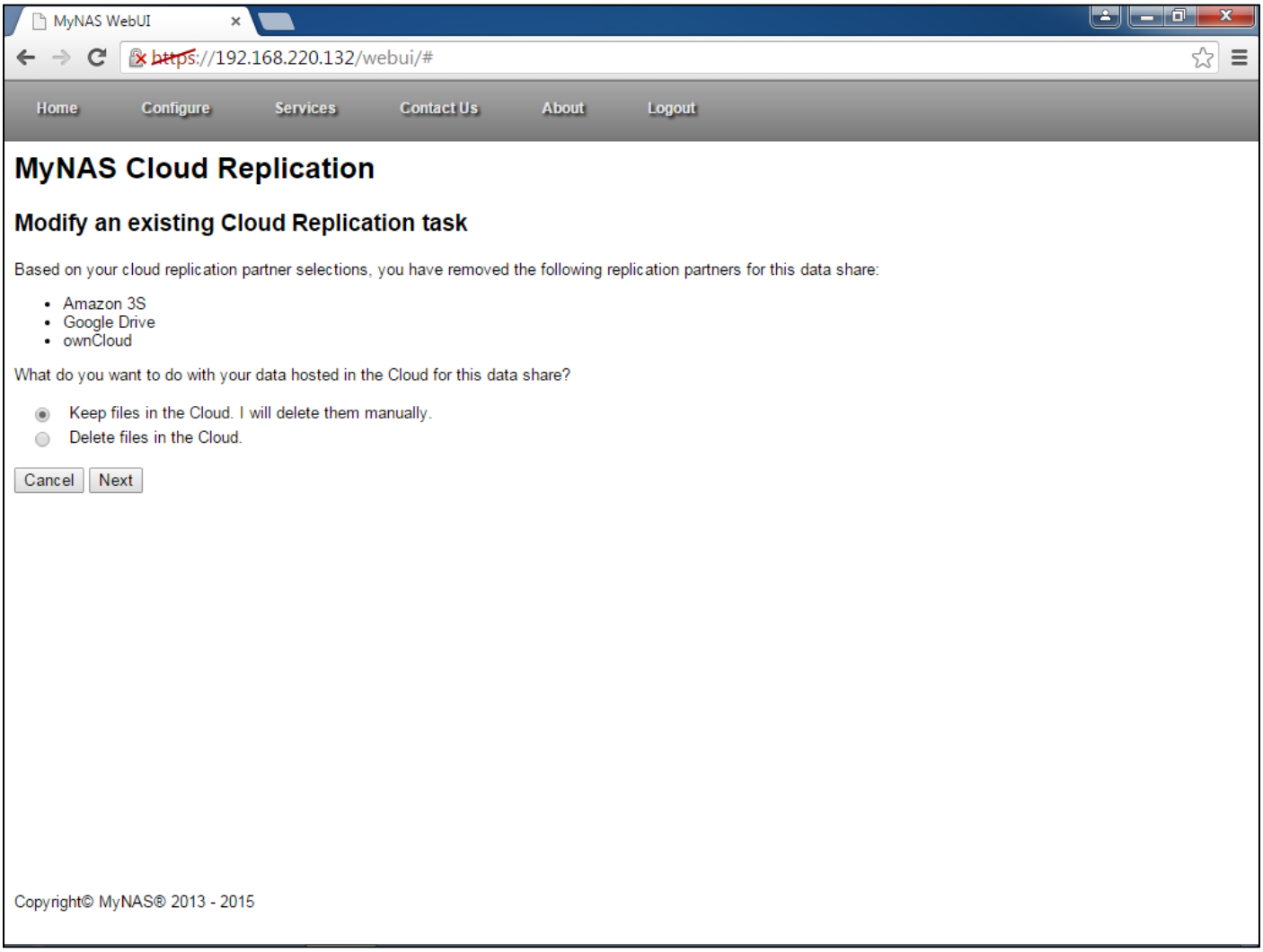


Once the replication partners are selected, click 'Next'

If any replication partners are being removed, the following question will be asked:

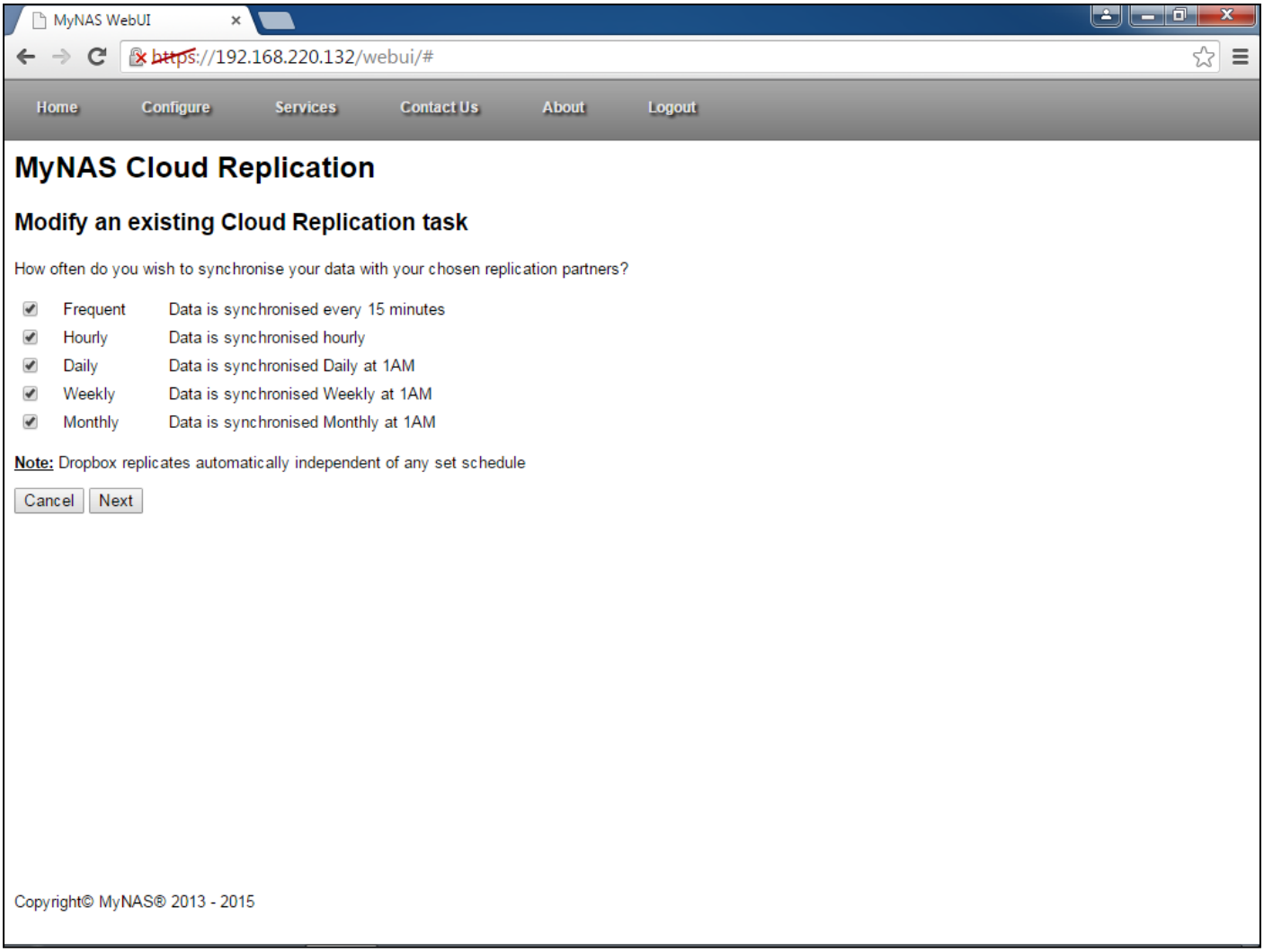
Do you wish to remove data from these replication partners as part of this process?

This is a good way to automatically clean up your data from Cloud Replication partners.



Selection the option you wish to use and click 'Next'

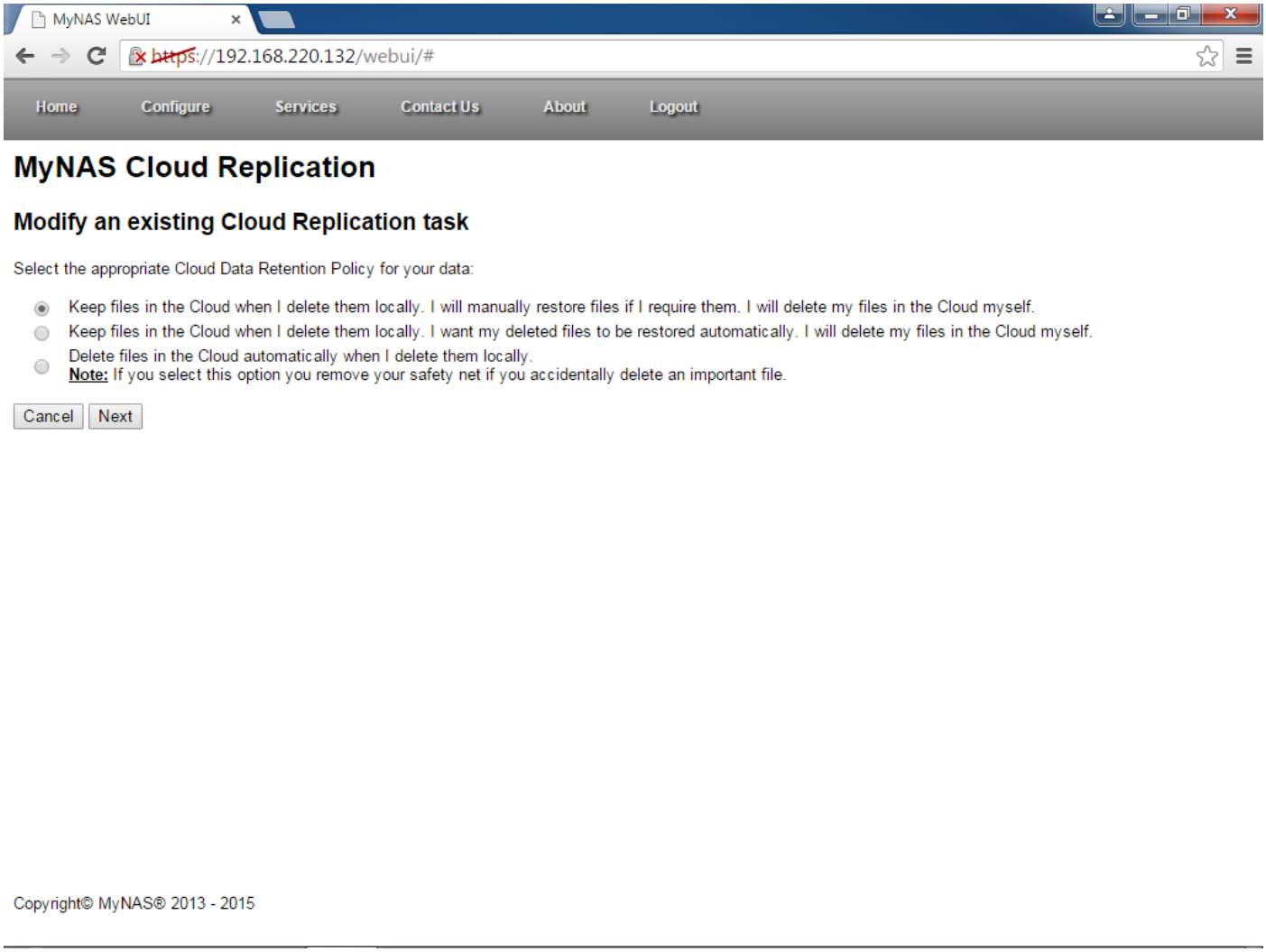
Modify the replication frequency if desired



Once configured, click 'Next'

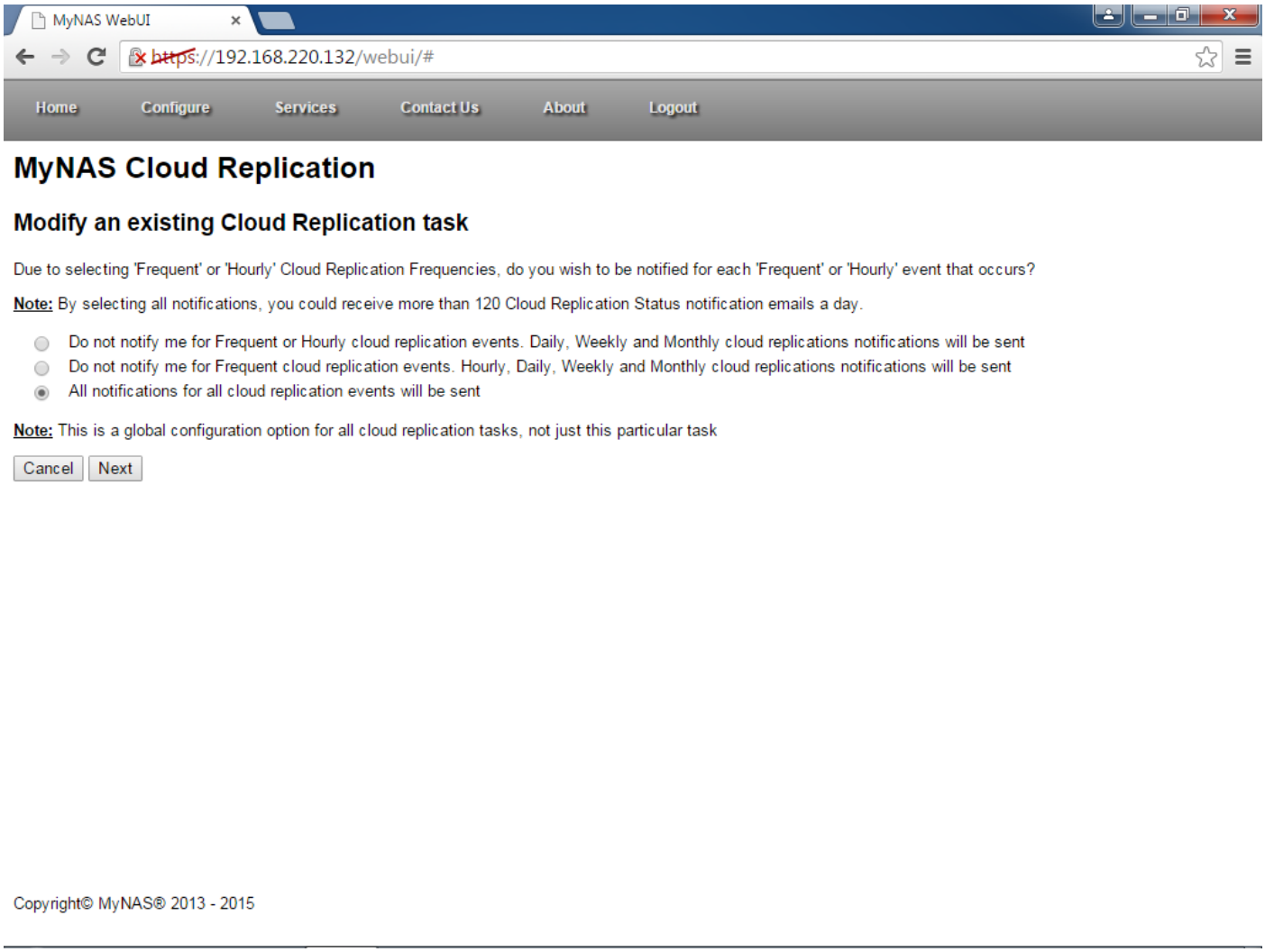
When selecting AmazonS3, Google Cloud Storage and Google Drive, MyNAS Storage Appliance has the capability to utilise Cloud Retention Policies.

These policies allow you to have these Cloud Replication Targets provide the capability to restore your data if you accidentally delete an important file.



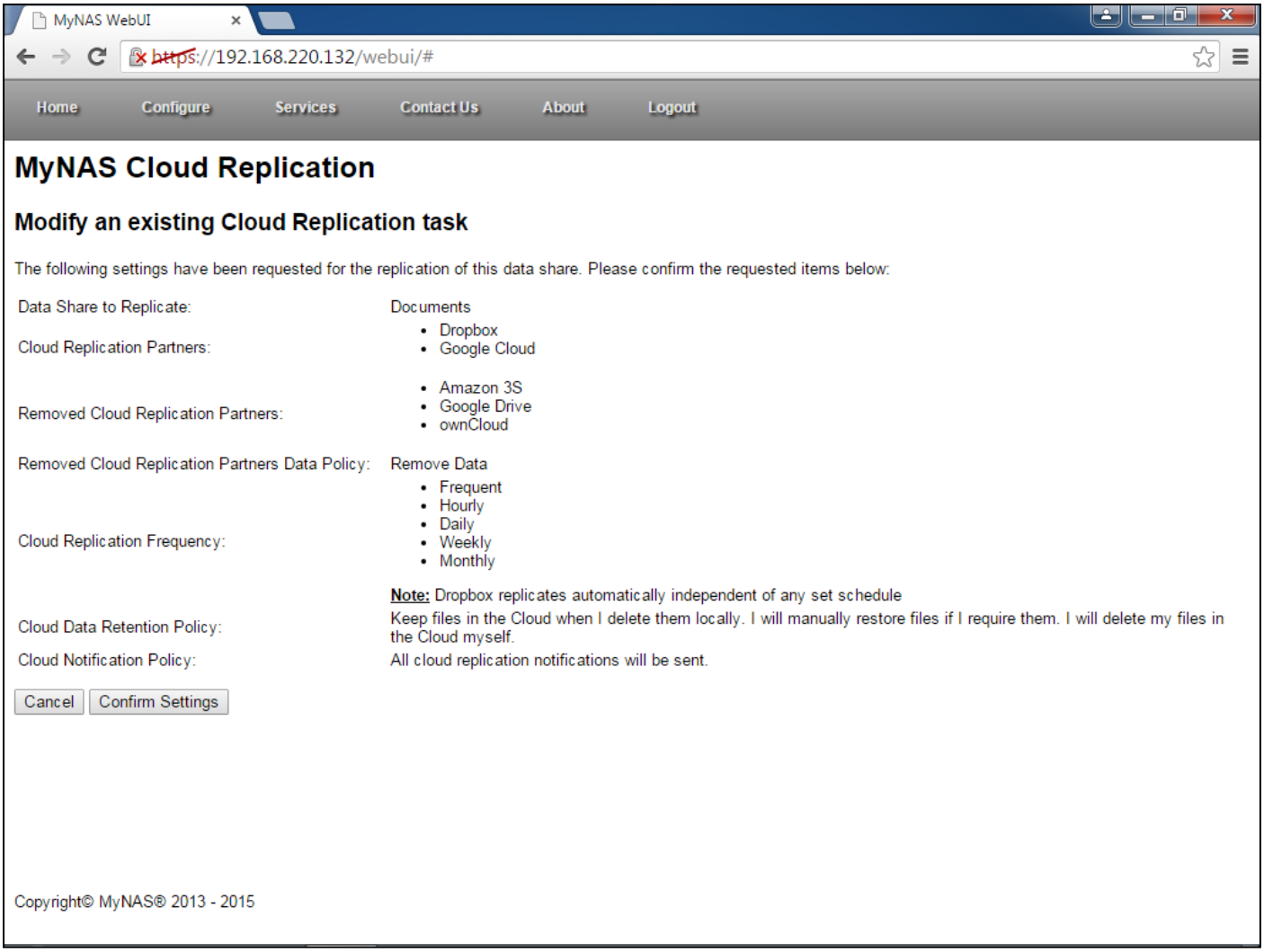
Modify the Cloud Retention policy if required and click 'Next'

Depending on the frequency selected, this could generate a significant number of messages per day. Select the appropriate notification frequency for you for all Cloud Replication Tasks



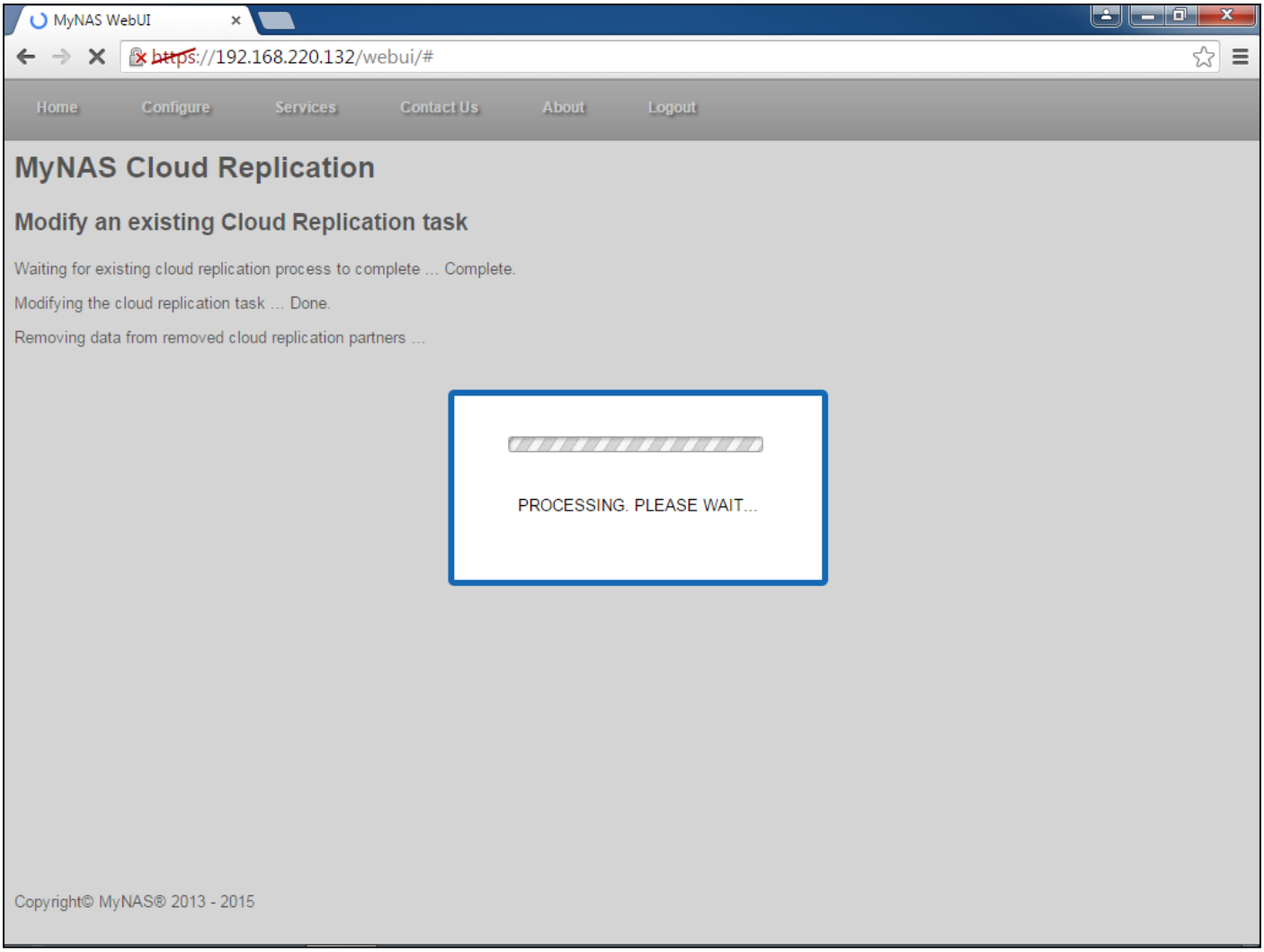
Modify the notification frequency if required and click 'Next'

Confirm the modification settings as displayed

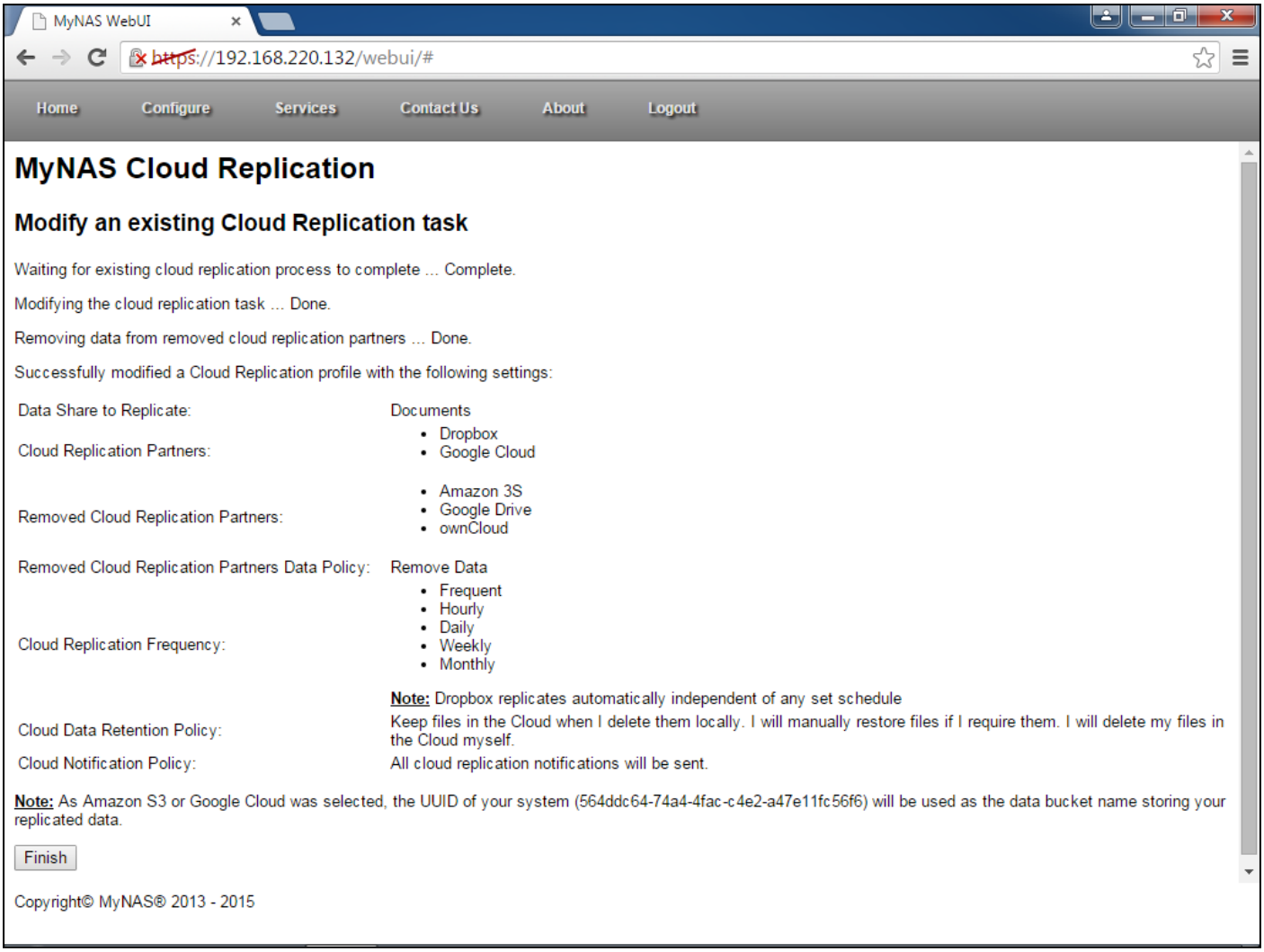


If the settings are correct, click the 'Confirm Settings' button.

MyNAS will now process the required changes for the replication task modification



Once the modification process is complete the following will be displayed:



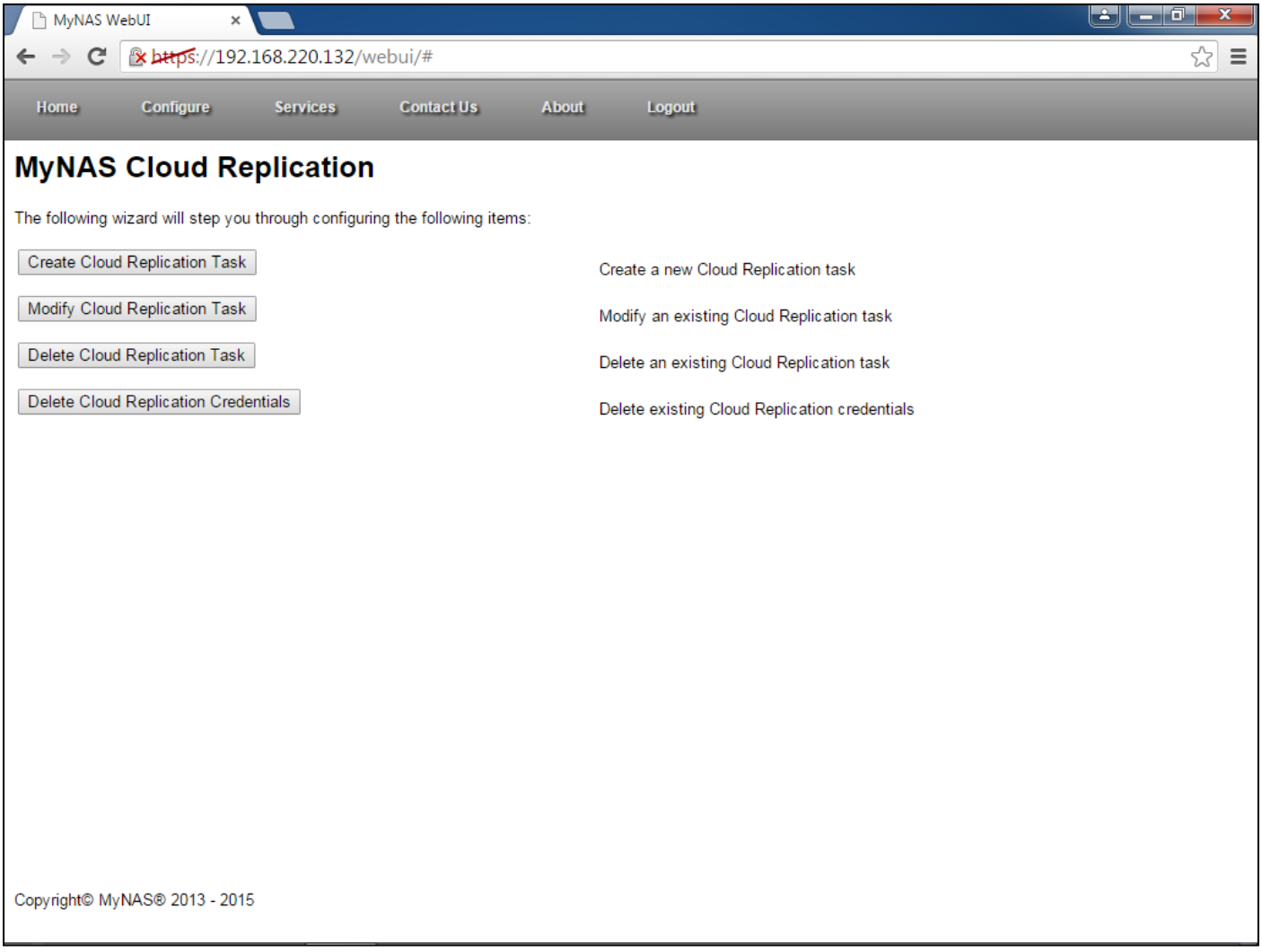
Click 'Finish' to close the modification wizard.

Delete a Cloud Replication Task

Deleing a Cloud Replication Task allows you to remove an existing MyNAS Data Share from being replicated externally.

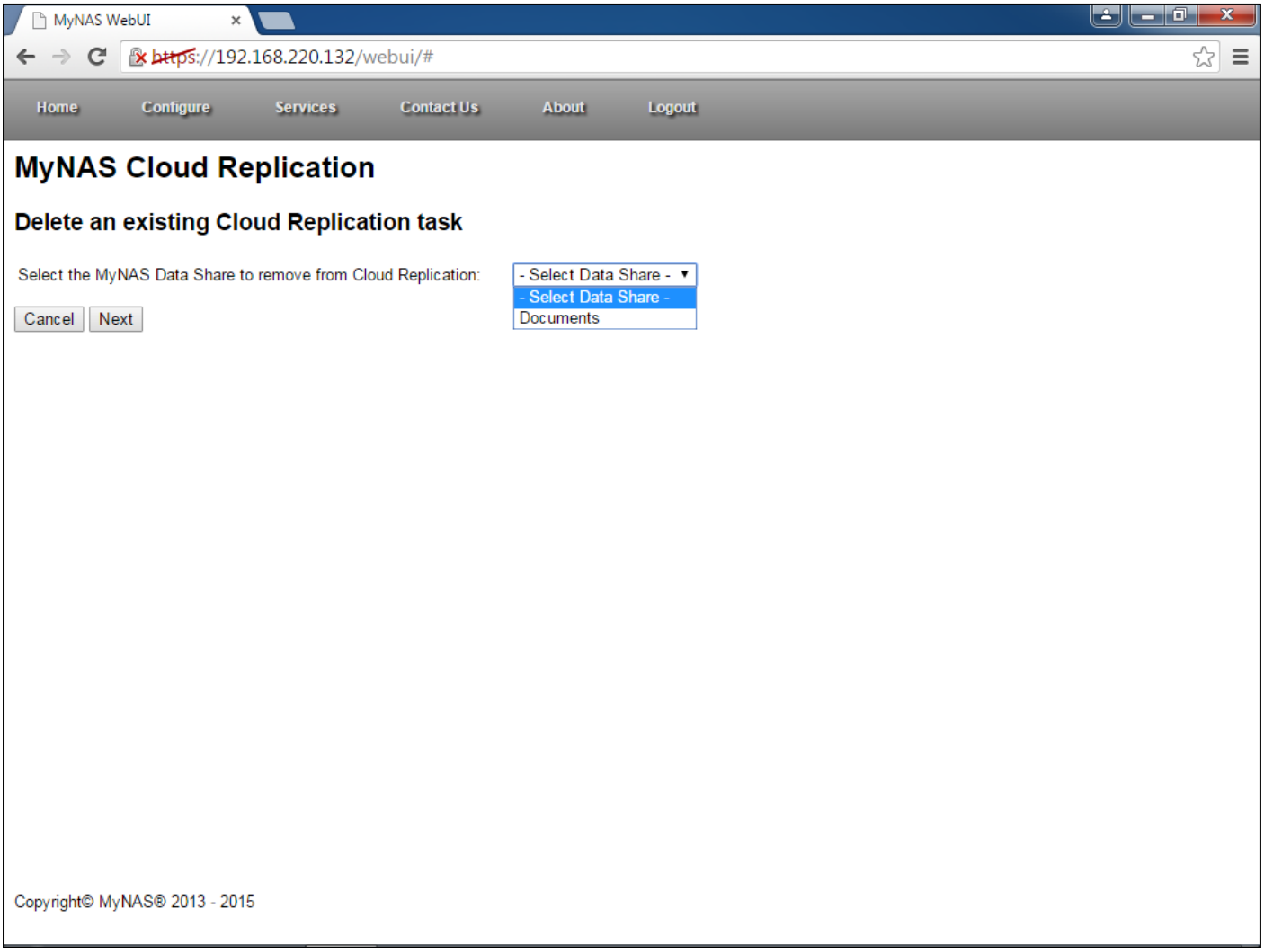
To delete an existing Cloud Replication Task on your MyNAS storage appliance, follow the directions below.

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Cloud Replication'. Once selected, the following will be displayed:



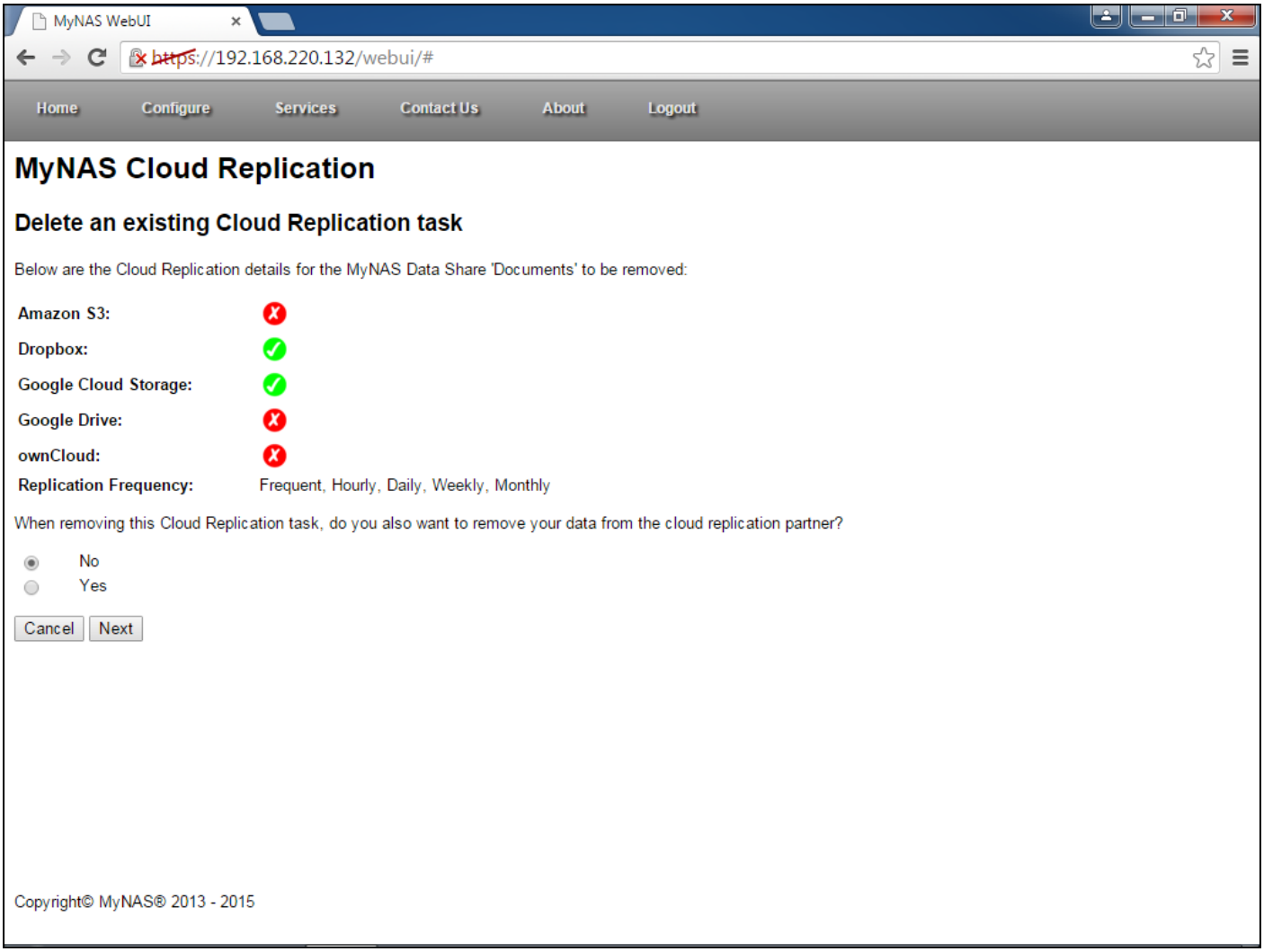
To delete a Cloud Replication Task, click the 'Delete Cloud Replication Task' button.

Select the MyNAS Data Share to remove the Cloud Replication Task for



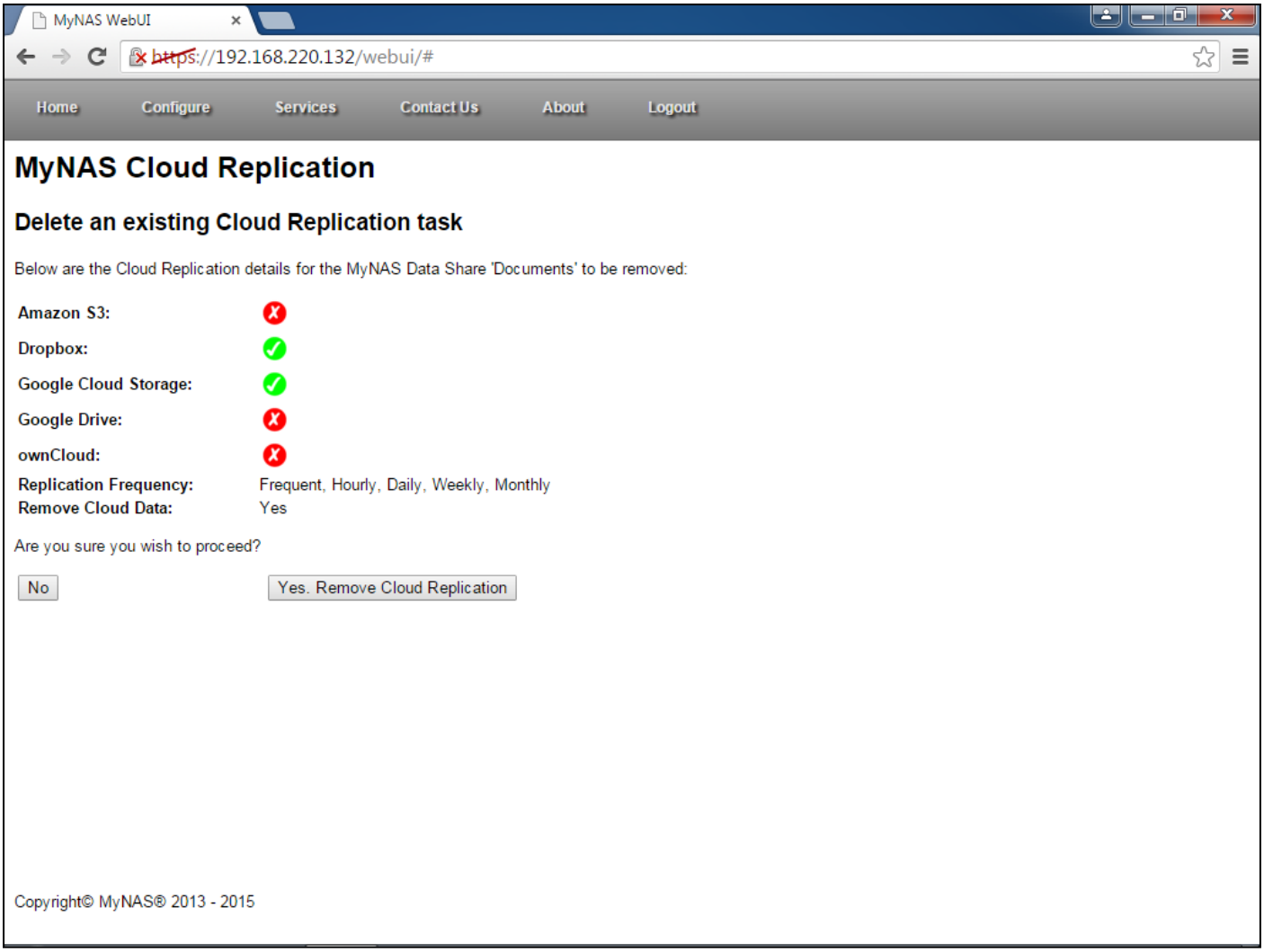
Once selected, click 'Next'

MyNAS will now prompt regarding Cloud Data removal. This provides an easy and automatic way to clean up your files in the cloud



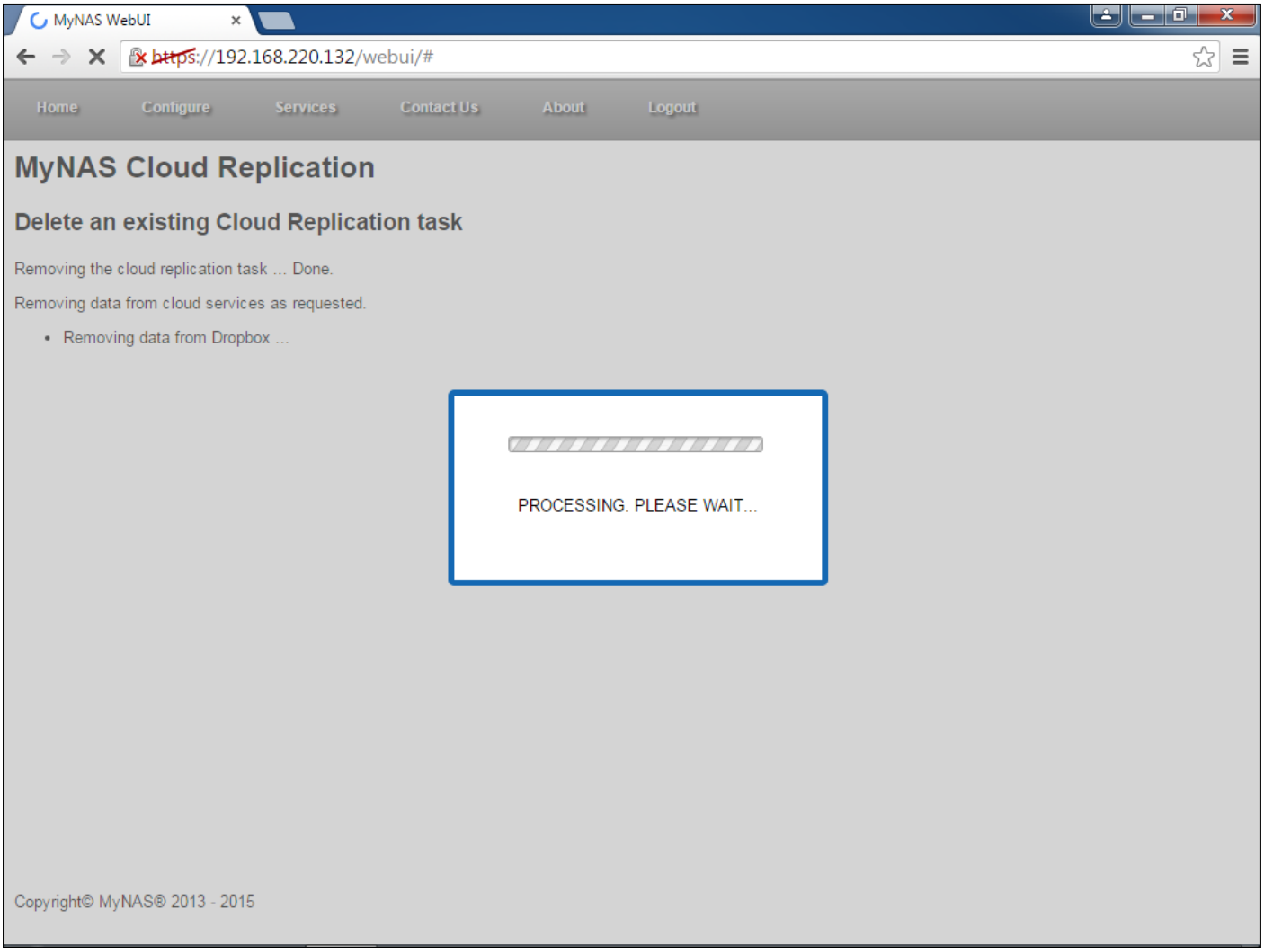
Select the option you wish to use and click 'Next'

Confirm the settings requested for the Cloud Replication Task Removal

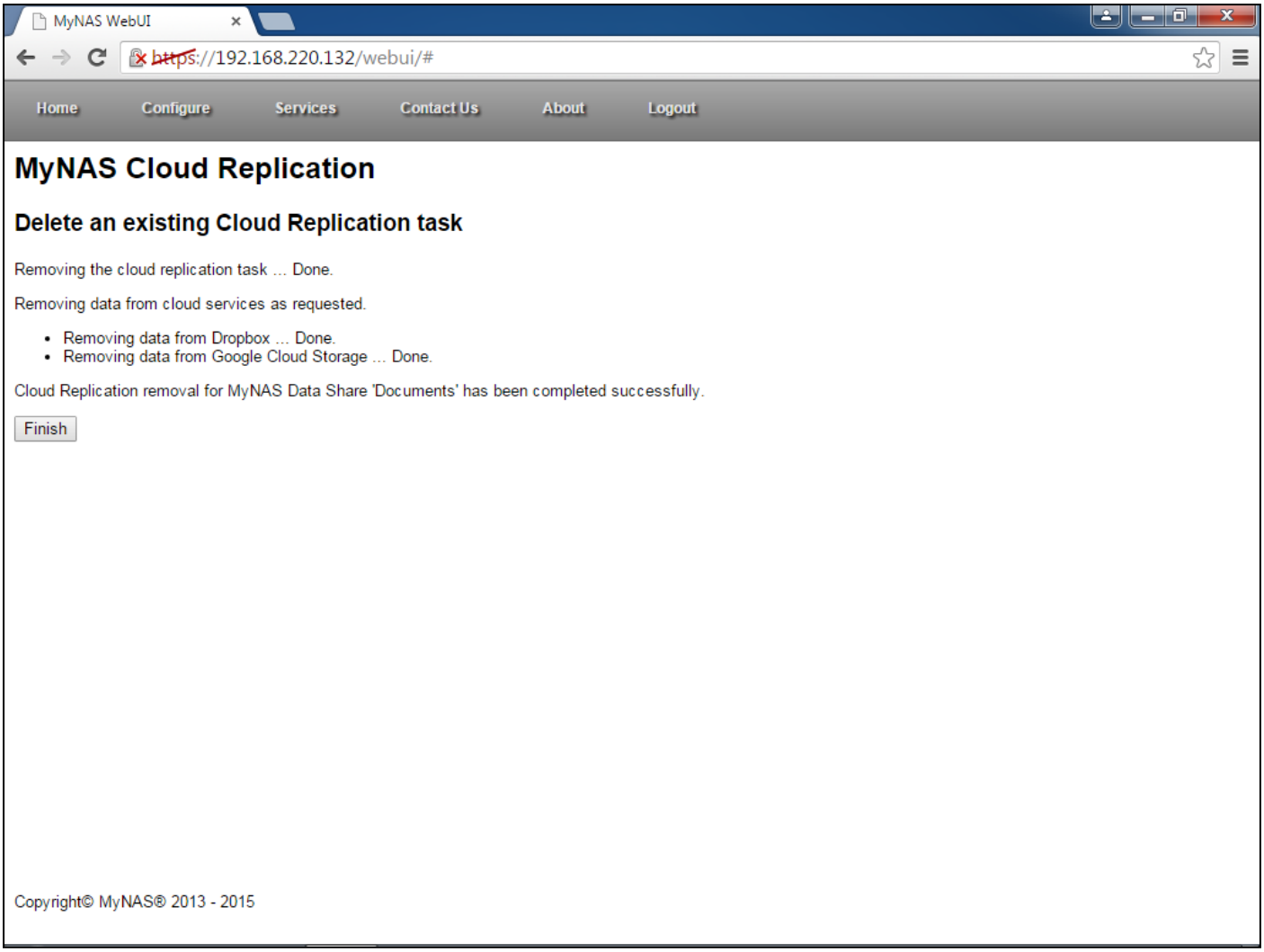


Once confirmed, click the 'Yes. Remove Cloud Replication' button.

MyNAS will now process the Cloud Replication Task removal, and process removing any data if requested



Once this task is complete the following will be displayed



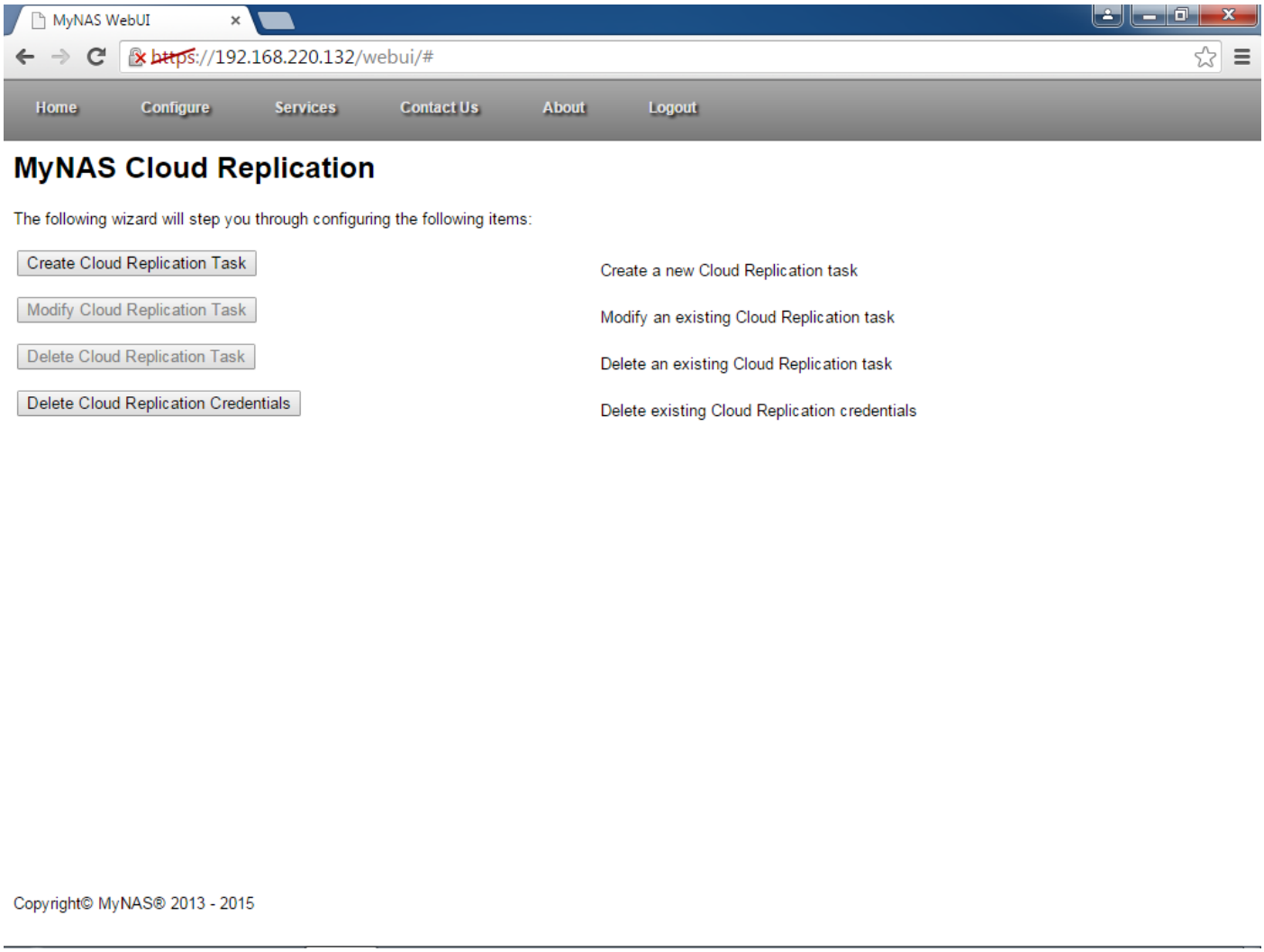
Click 'Finish' to complete the wizard.

Delete Cloud Replication Credentials

Delete Cloud Replication Credentials provides the capability to remove the credentials used to store your data with the Cloud Storage Providers

To delete Cloud Replication Credentials on your MyNAS storage appliance, follow the directions below.

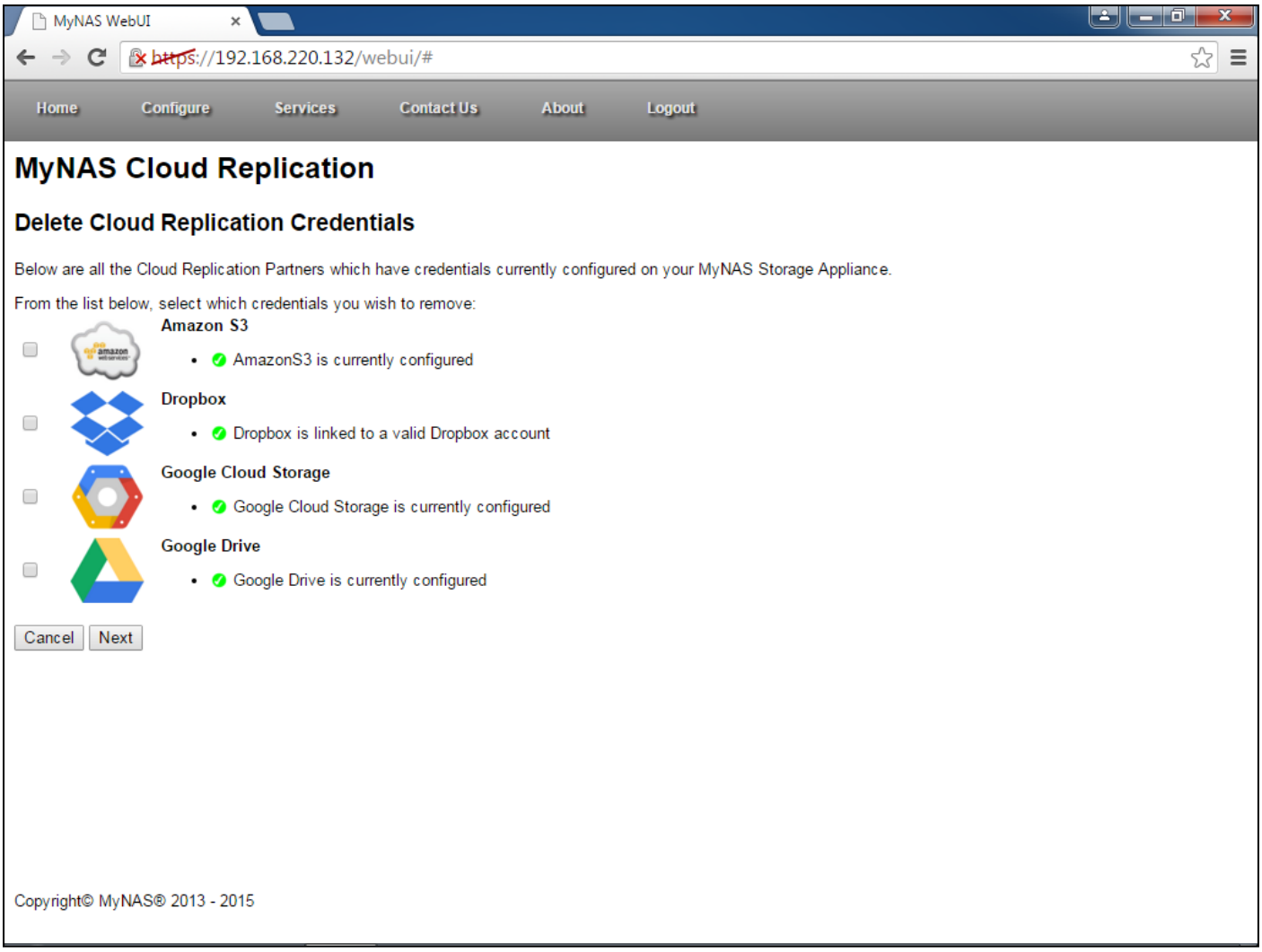
Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Cloud Replication'. Once selected, the following will be displayed:



To delete Cloud Replication Credentials, click the 'Delete Cloud Replication Credentials' button

Select the Cloud Replication Credentials you wish to remove from your MyNAS Storage Appliance

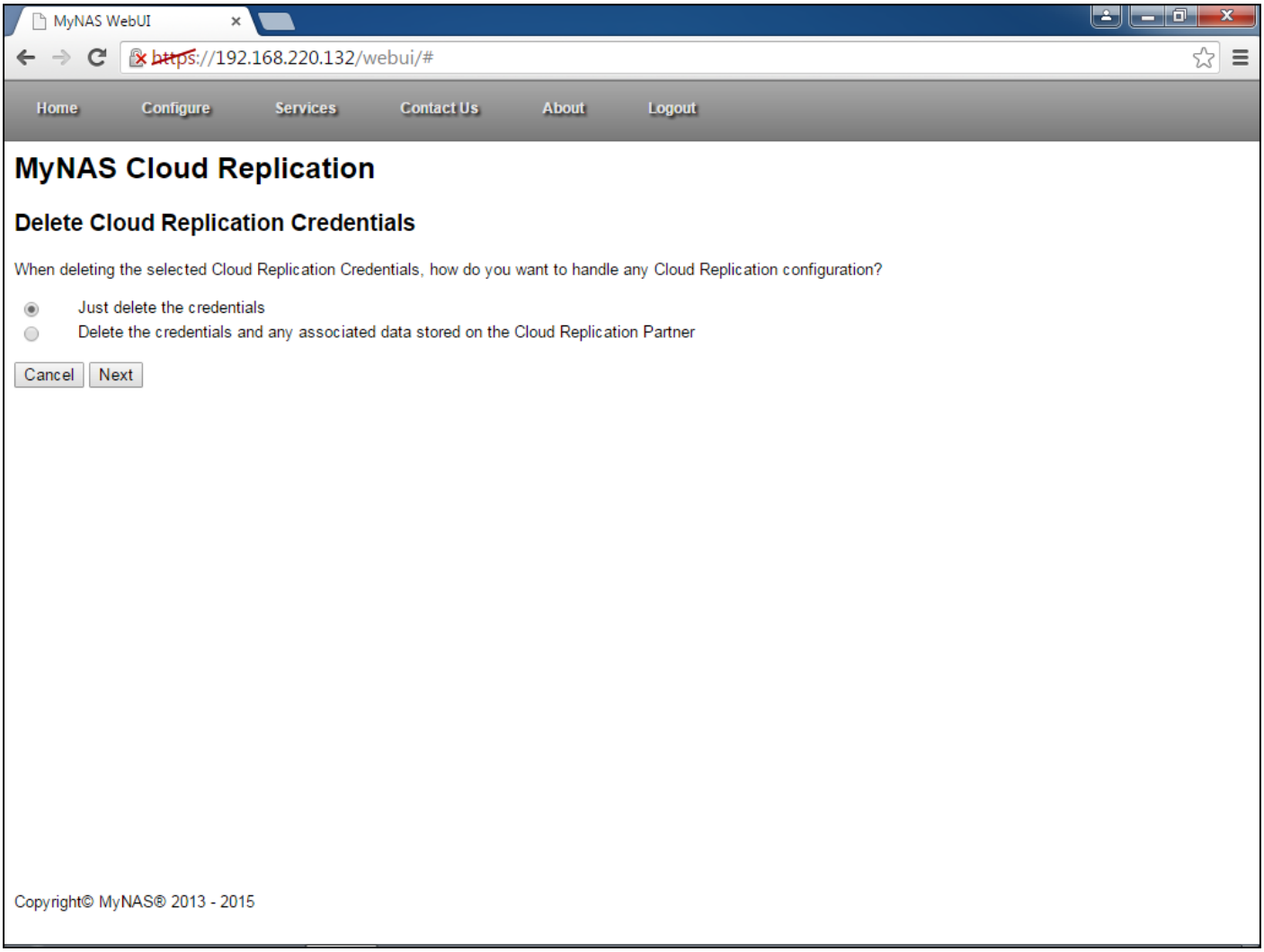
Note: As ownCloud credentials are stored differently, when a Cloud Replication Task involving an ownCloud Provider is removed, the credentials are automatically removed.



Select the credentials you wish to remove and click 'Next'

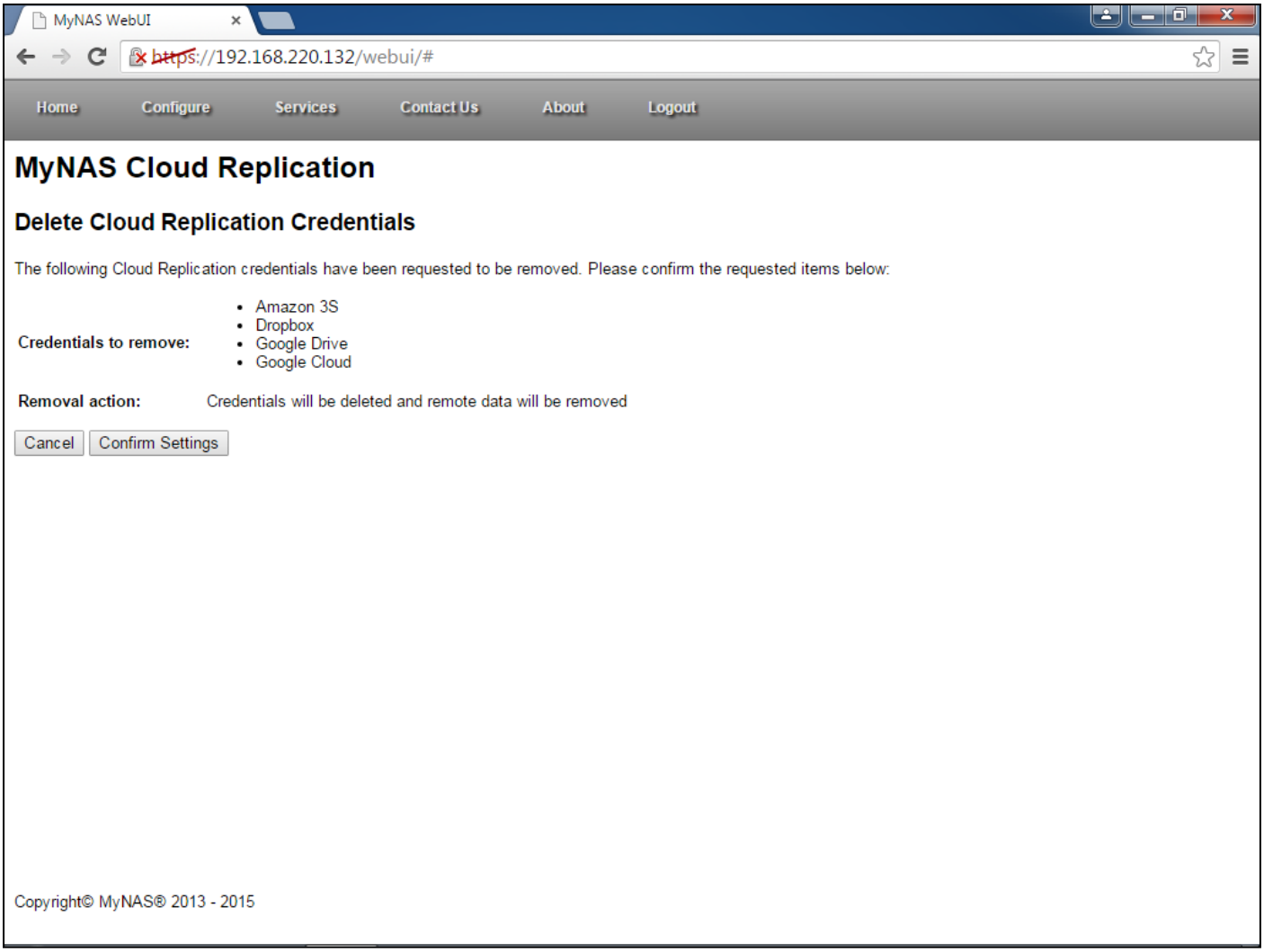
MyNAS provides an automatic capability to clean up any data on those Cloud Providers before removing the credentials.

This may be handy when we are removing the credentials from MyNAS, but we may still have replication tasks or data. This will clean up any data if required from those affected Cloud Providers



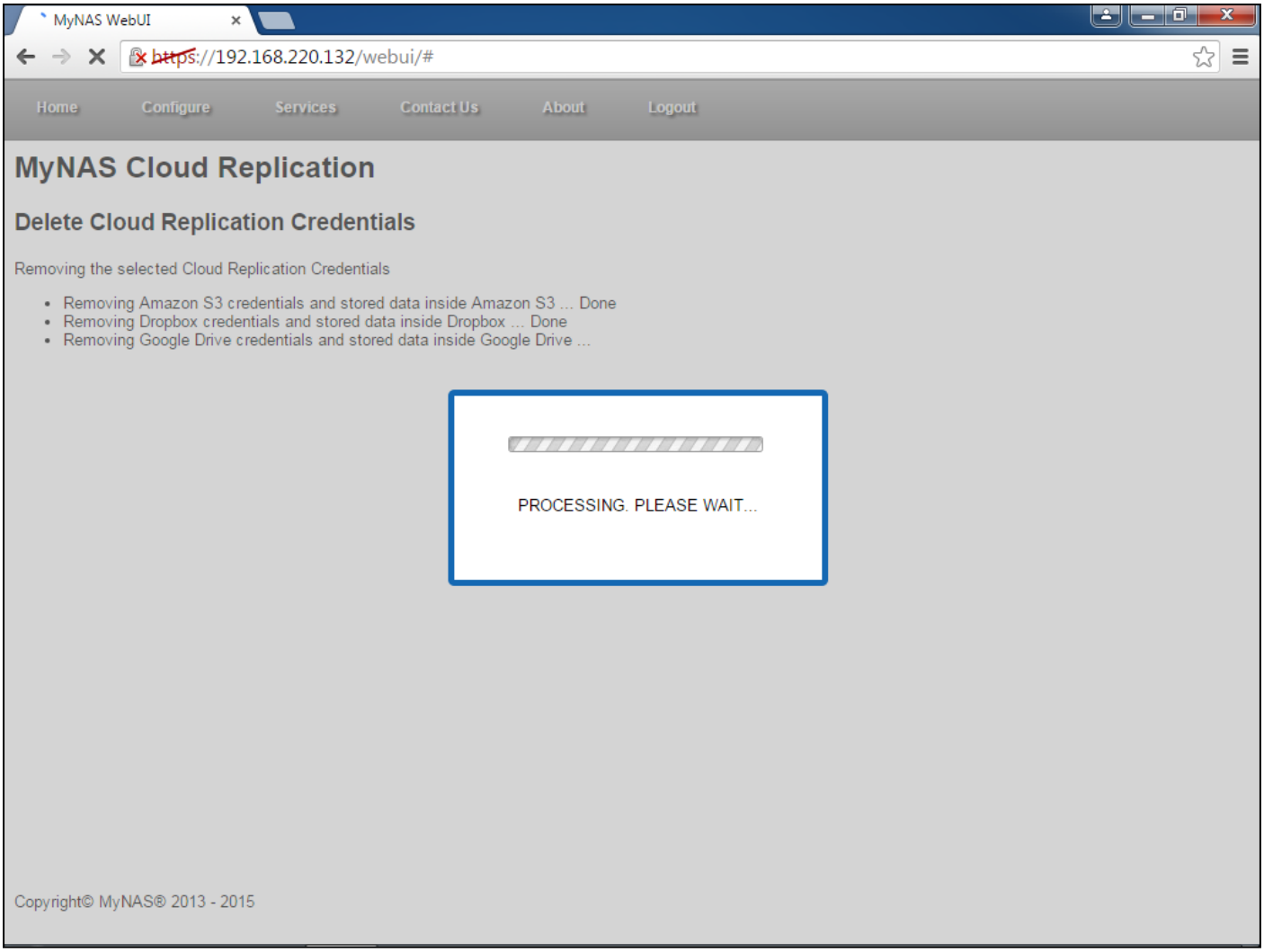
Select the applicable data handling option and click 'Next'

Confirm the settings requested

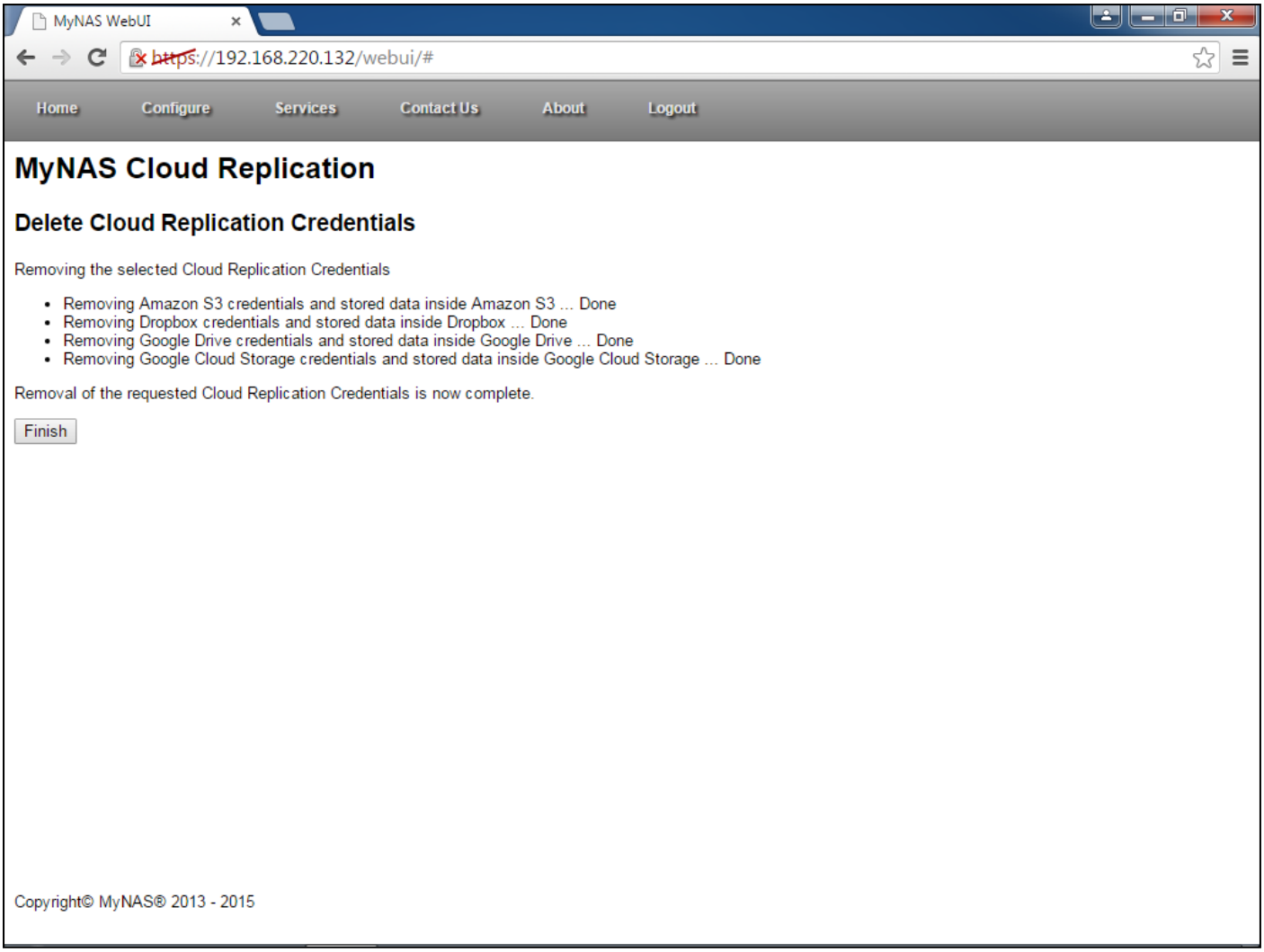


Once the settings are confirmed, click 'Confirm Settings'

MyNAS will now process the credential removal including data removal if selected



Once complete the following will be displayed:



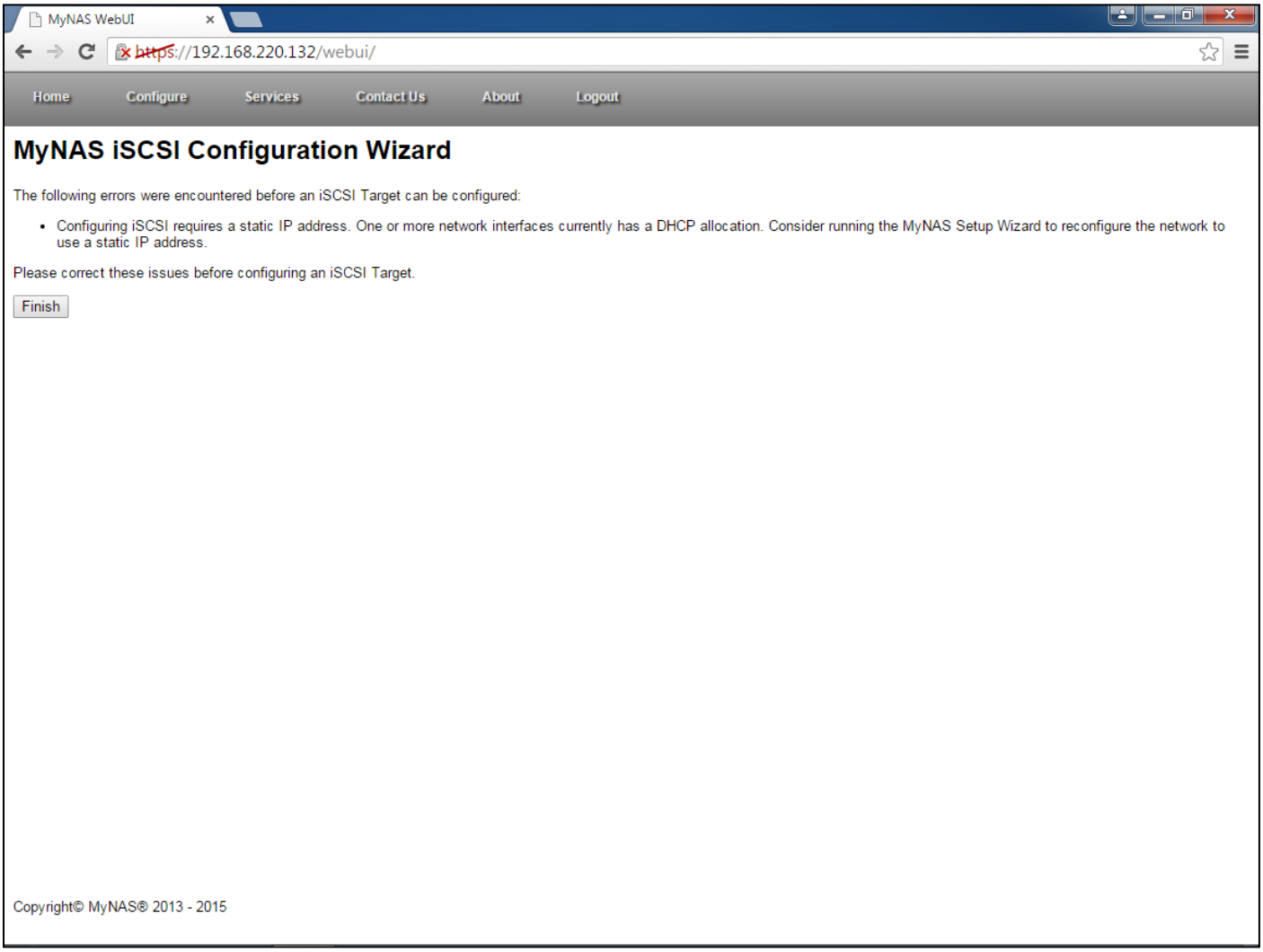
Click 'Finish' to complete the wizard

Using iSCSI and your MyNAS® Storage Appliance

iSCSI provides the capability for you to use your MyNAS storage appliance just like another drive on your local computer - when you are connected to your network at home.

The iSCSI Target can be used with Windows, Linux, Apple and VMware ESXi.

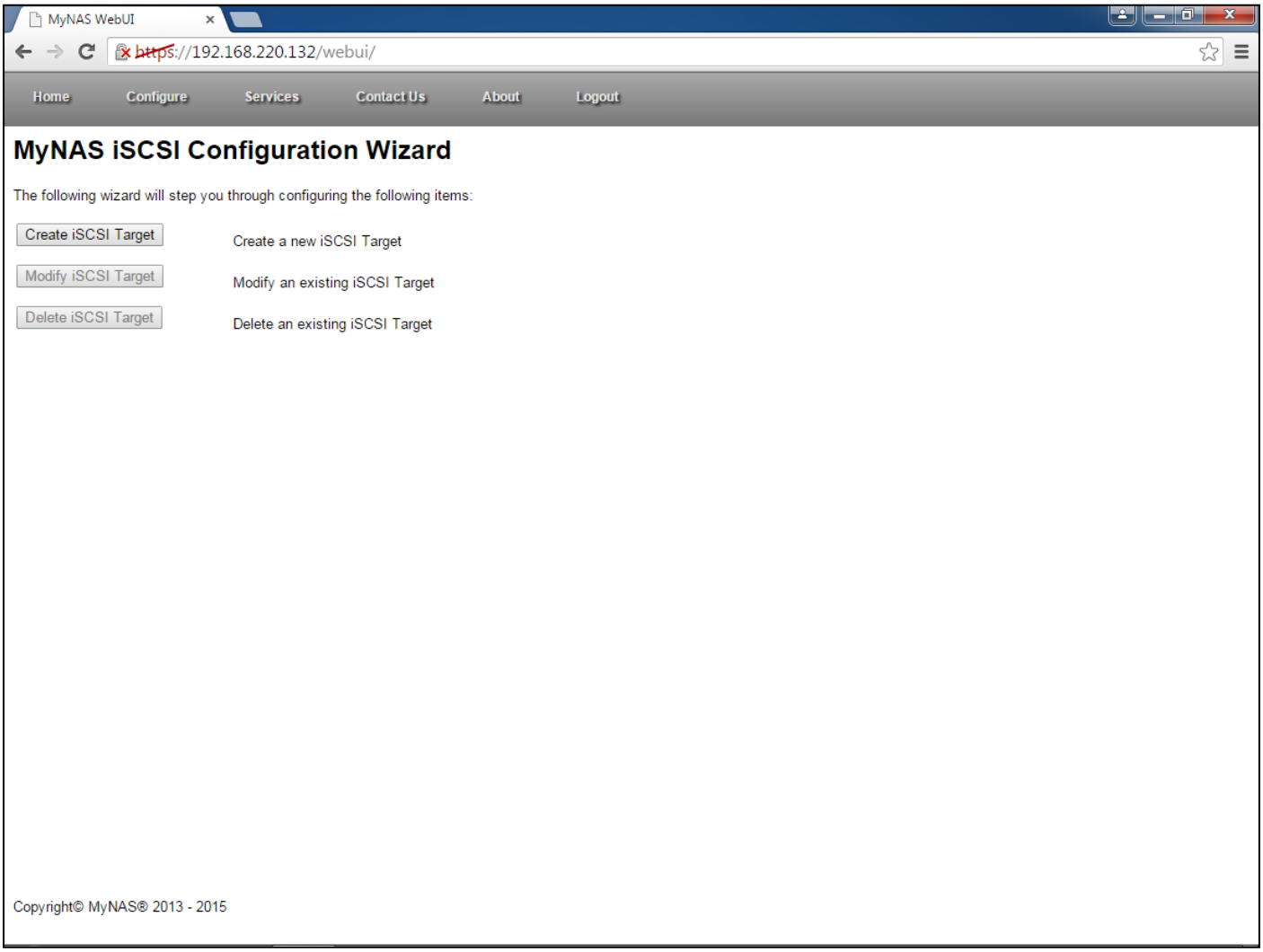
Note: Creating an iSCSI Target requires MyNAS to be configured to utilise a static IP address. This ensures that any clients connecting to MyNAS for iSCSI services will always access the same service.



Creating an iSCSI Target

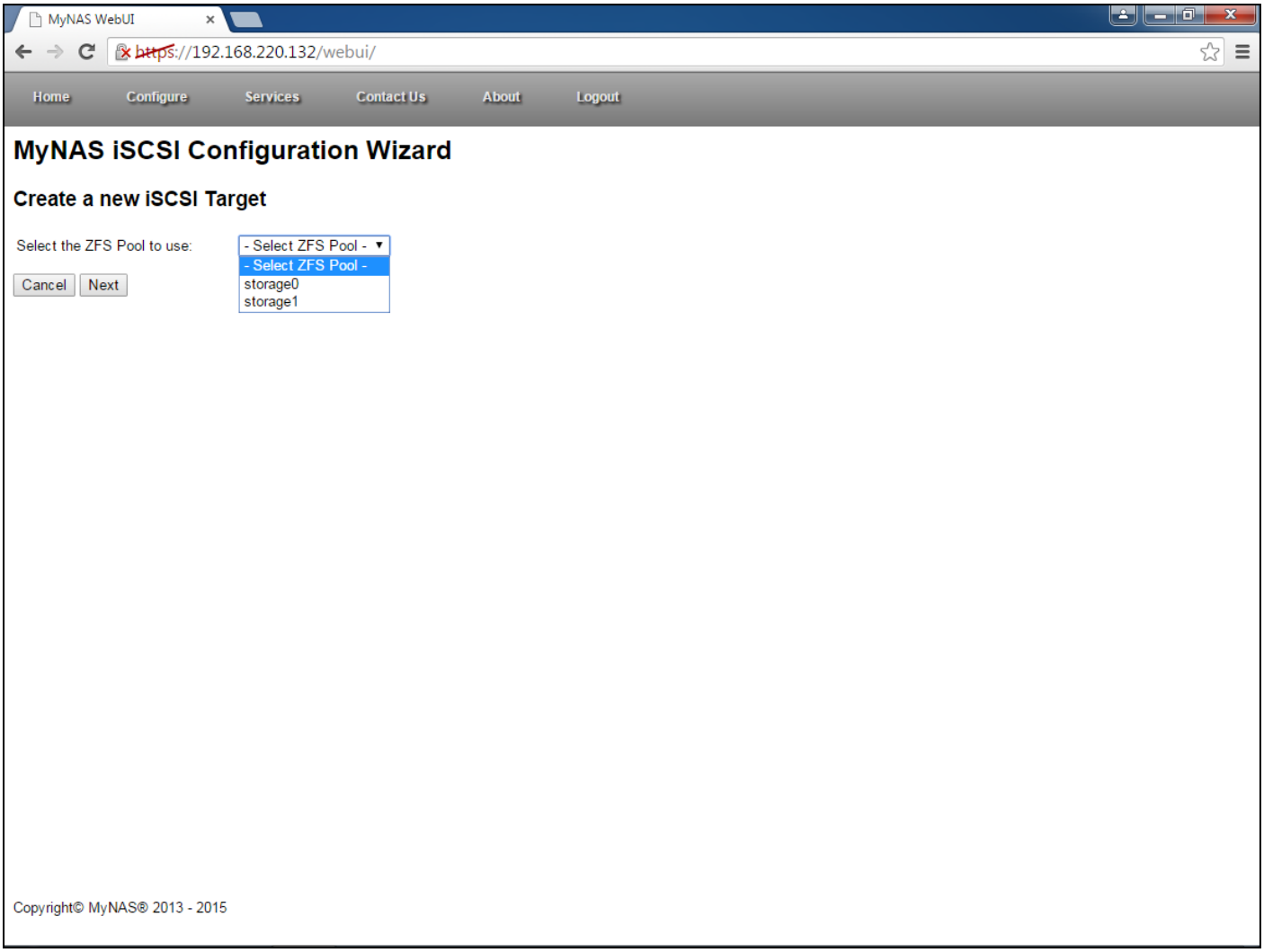
To create an iSCSI target on your MyNAS storage appliance, follow the directions below:

Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure iSCSI Targets'. Once selected, the following will be displayed:



To create an iSCSI target, click on the 'Create iSCSI Target' button.

Depending on the ZFS Pool configuration, if there are more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for the iSCSI Target creation:



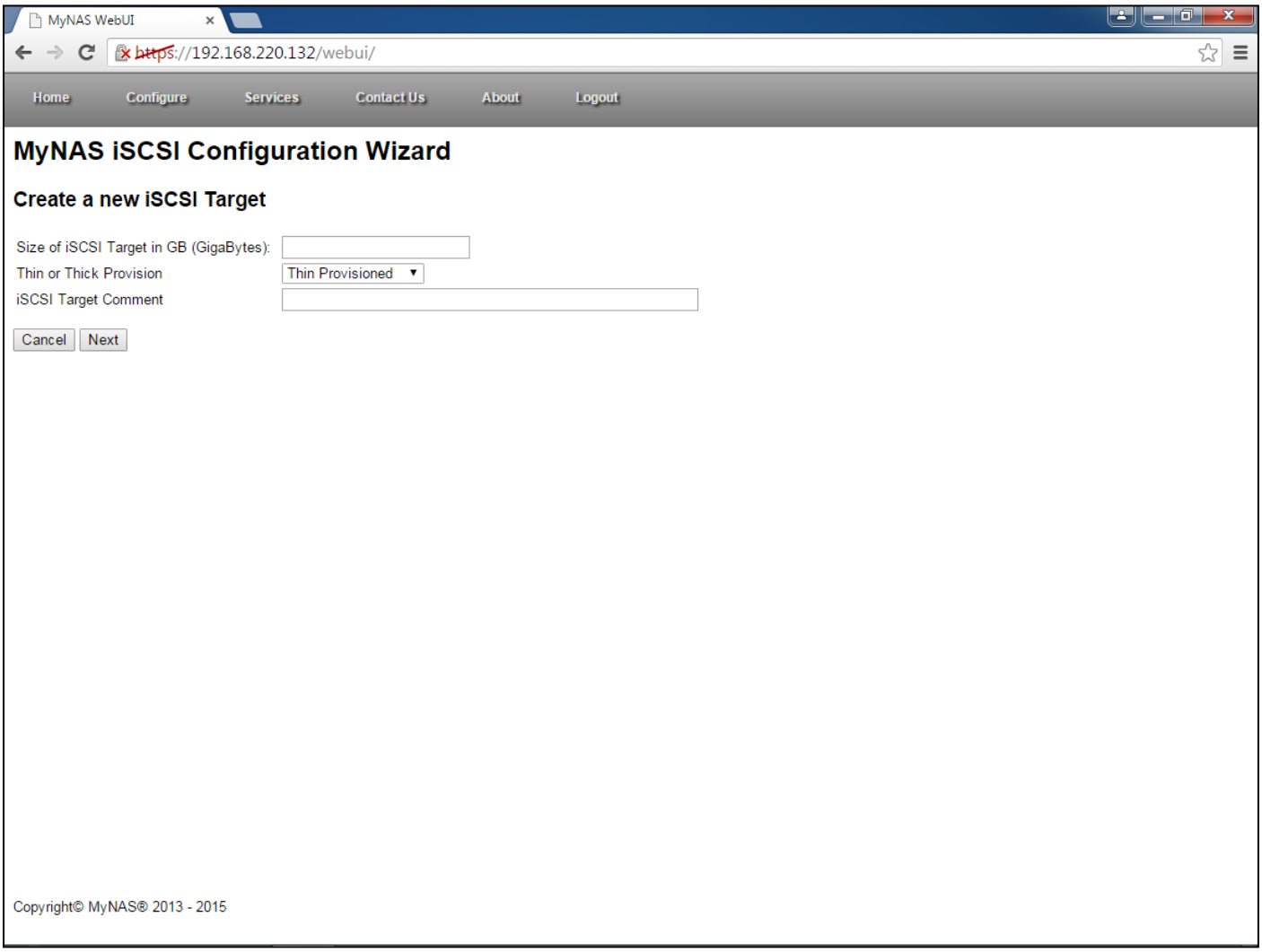
Select the appropriate ZFS Pool and click next

Configure the iSCSI Target with the applicable information:

- Size of the iSCSI Target in GB
- Thin or Thick Provisioned
    - Thin provisioned means to allocate the storage as needed up to the configured size
    - Thick provisioned means to allocate all the storage now
- iSCSI Target comment - useful for identifying what iSCSI target is used for what purpose later on

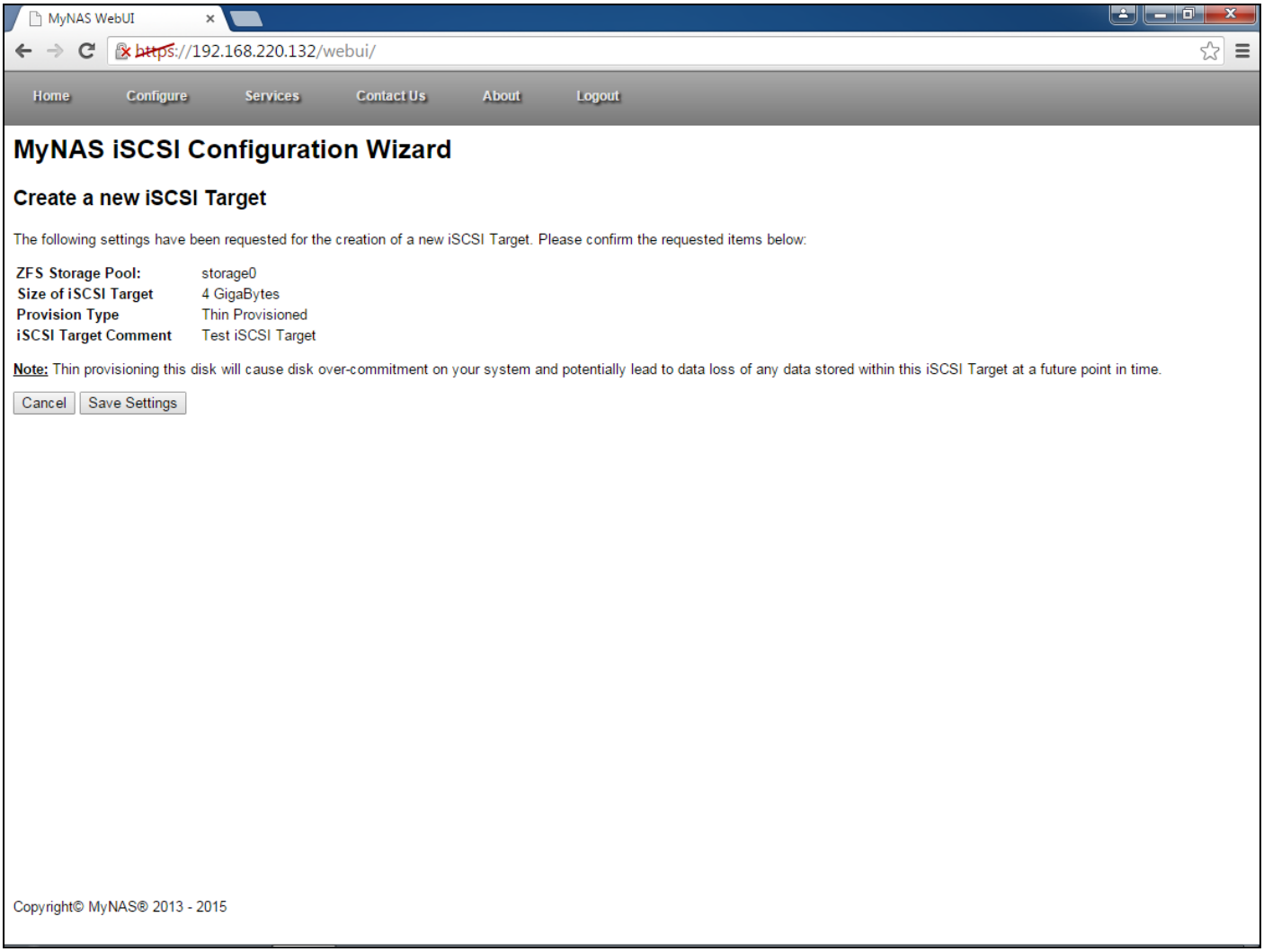
Thin provisioning makes better use of the underlying storage for all other operations, whilst thick provisioning will lock out that entire space for that iSCSI target - meaning if you do not use all that space on the guest side of the iSCSI Target, it is wasted space.

Performance wise, there is negligible measurable performance difference between thin and thick provisioning.



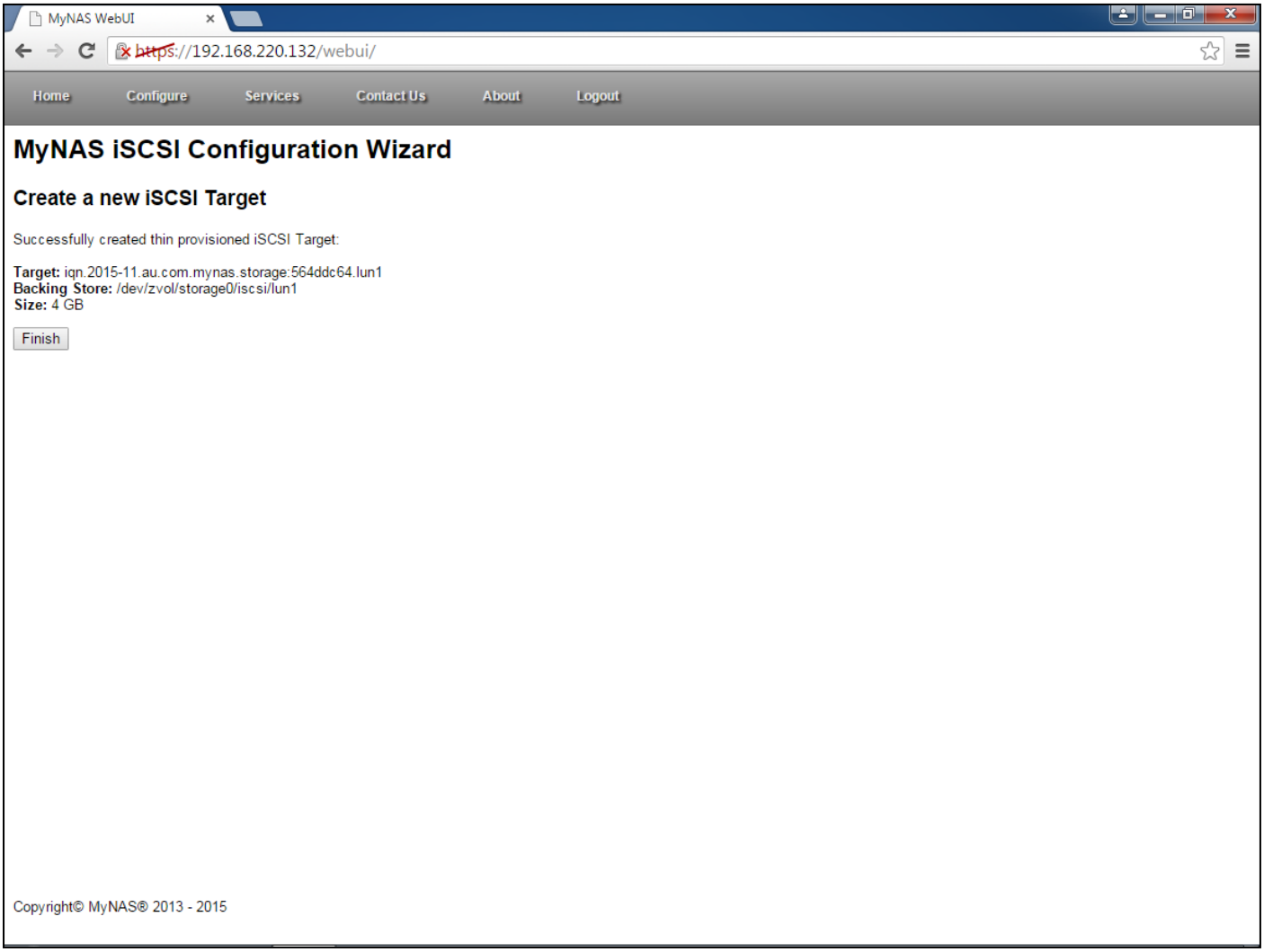
Once all items are configured, click Next to continue

Confirm that these are the settings you wish to use



Click 'Save Settings' to confirm and provision the new iSCSI Target

Once the iSCSI Target is created, click 'Finish' to complete the task.



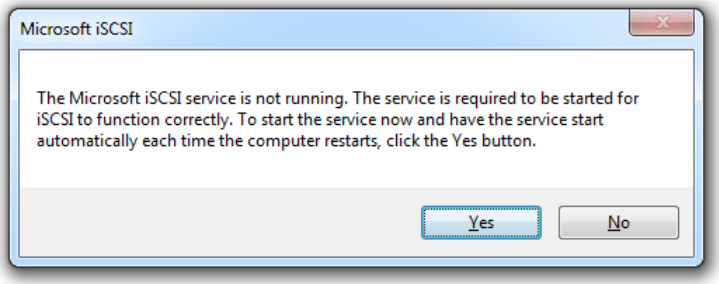
The new iSCSI Target will now be available for use on Windows, Linux, Apple or VMware.

Access a MyNAS iSCSI Target from a Windows 7 / Windows 2008 R2 system

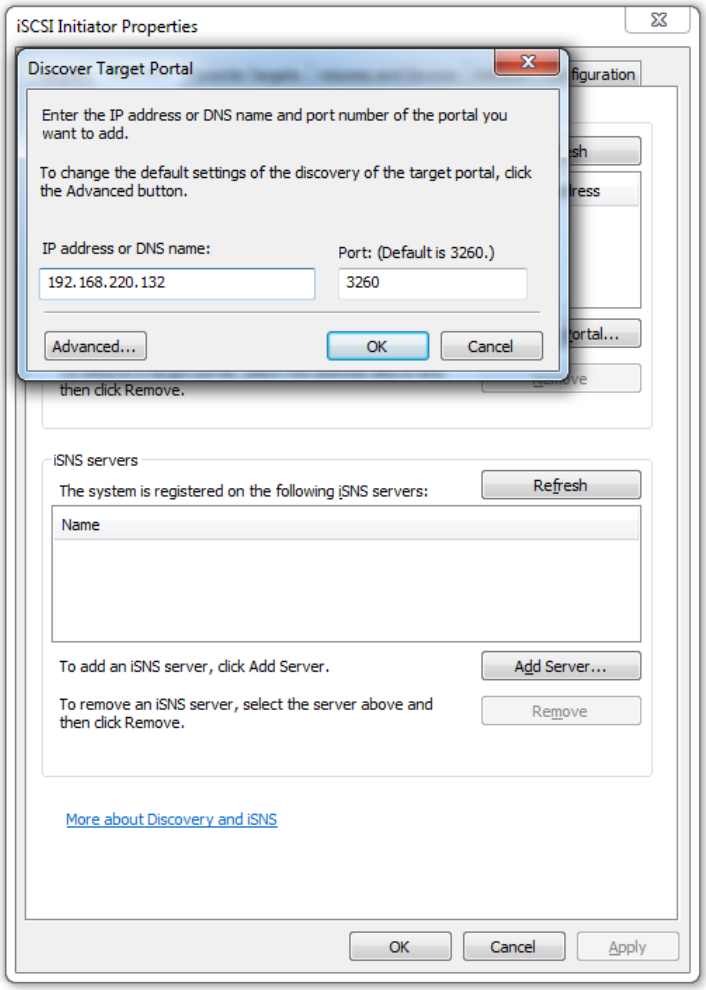
Once an iSCSI Target is created, Windows 7 provides an integrated iSCSI Initiator to access iSCSI Targets. Follow the steps below to configure the iSCSI Target using the Microsoft iSCSI Initiator.

Note: An iSCSI target can be accessed from many clients, however the requirement to format the iSCSI target will only be required for the first use / access of that particular iSCSI target.

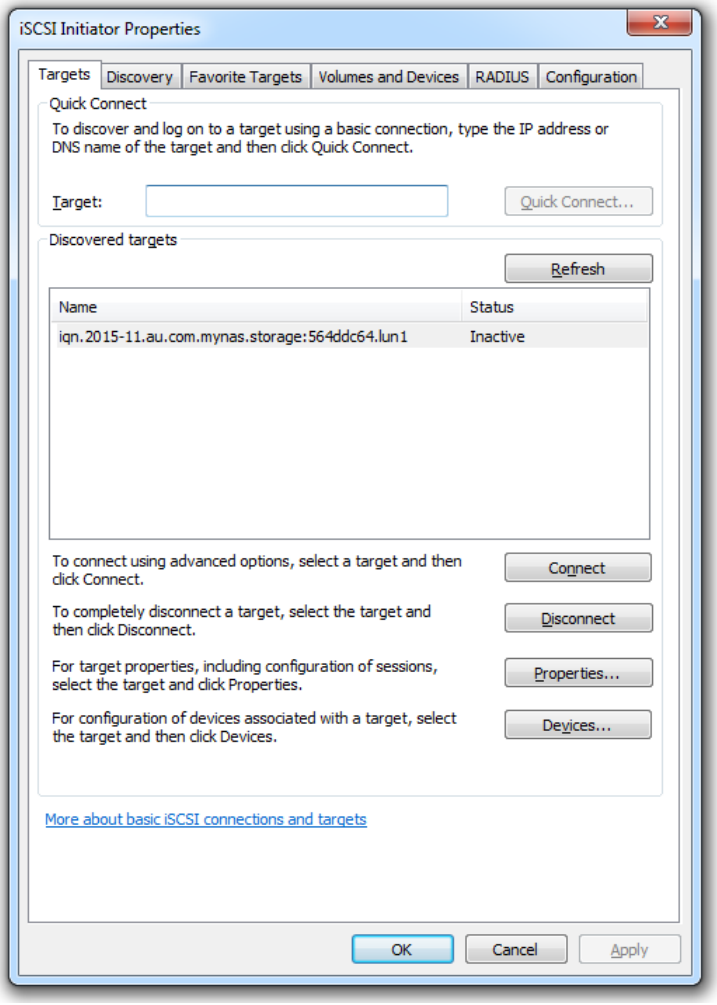
1. From Windows 7, go to: Control Panel → Administrative Tools → iSCSI Initiator. The first time the iSCSI Initiator is run, it will prompt to start the service as illustrated below. Click 'yes' to start the service.



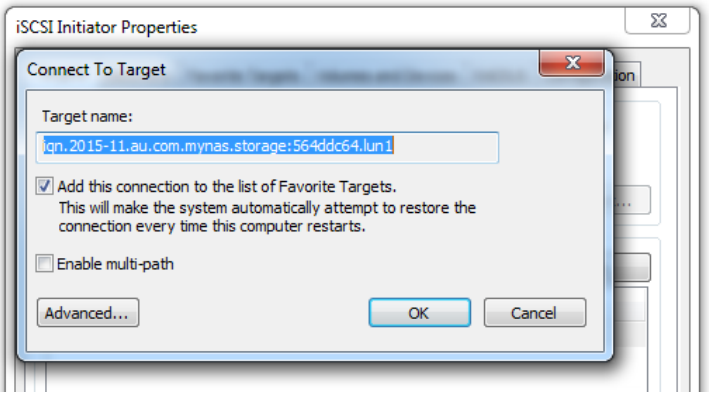
2. Under the Discovery Tab, click on the Discover Portal button and enter in the IP address of the MyNAS storage appliance. Click OK when complete.



3. Click on the Targets Tab and click Refresh. The configured iSCSI Targets on the MyNAS storage appliance will be displayed as per below:

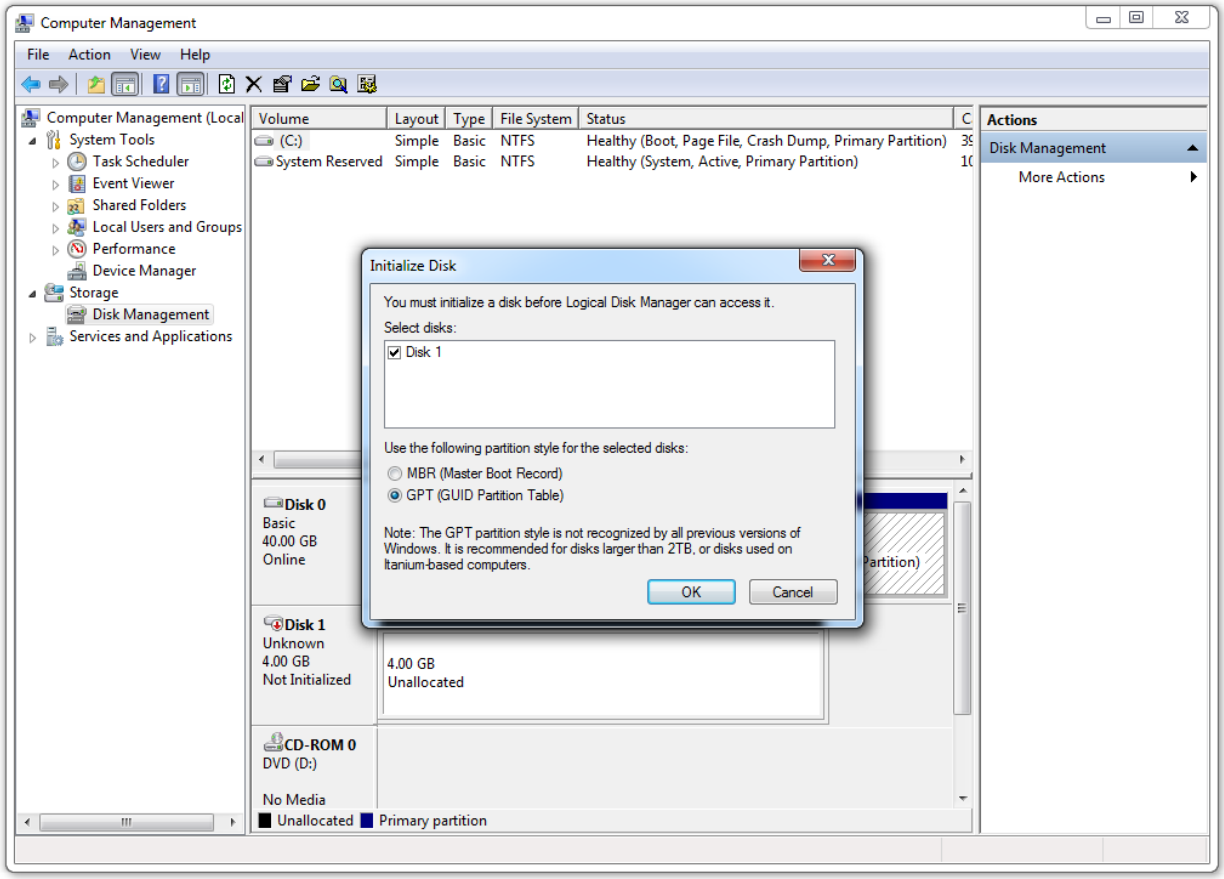


4. To connect to one of the configured iSCSI target, click on the Target and then Connect, then OK. Click OK again to close the iSCSI Initiator Properties.



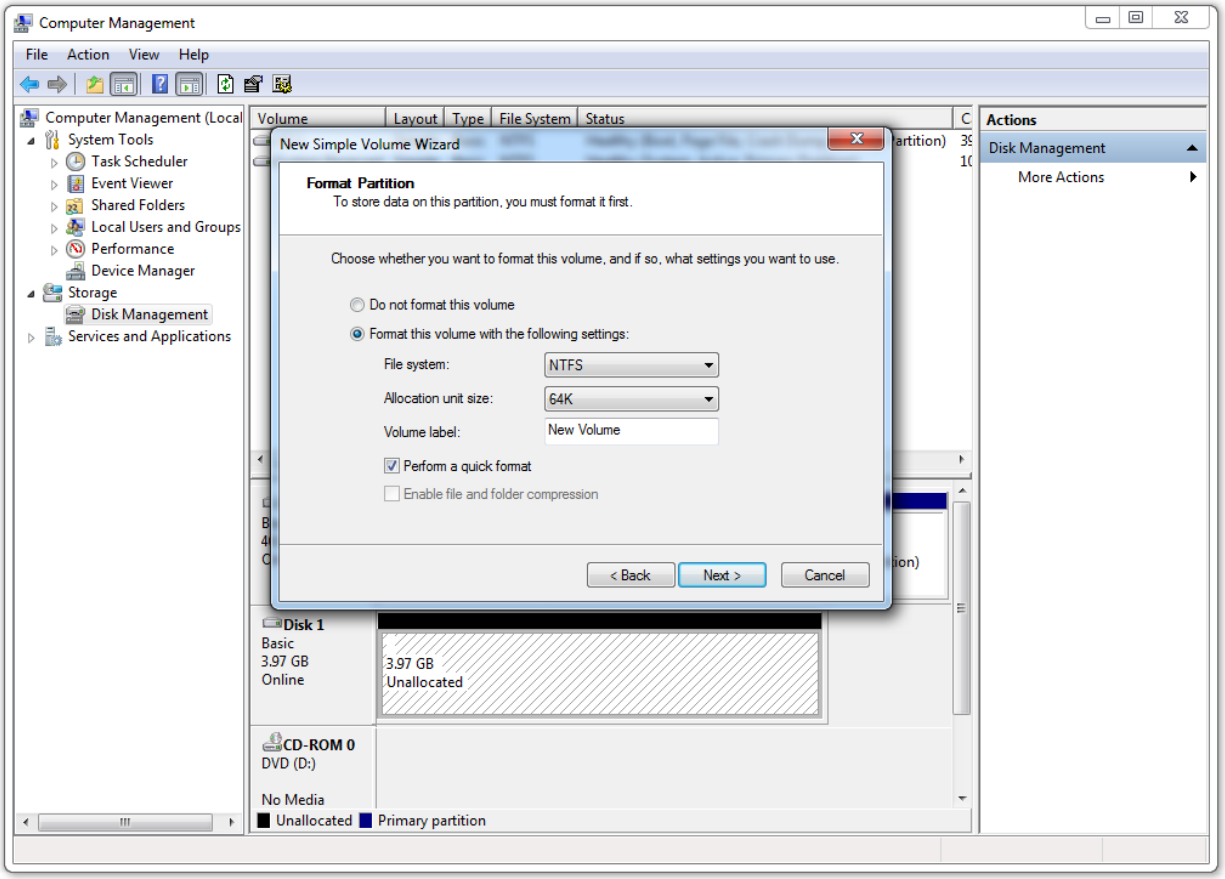
5. To use the disk under Windows, if it has not been used before, it first needs to be formatted. This only needs to be done once for each new iSCSI Target.

Go to: Control Panel → Administrative Tools → Computer Management, then click on Disk Management. A popup should appear asking to Initialise the disk as per below:

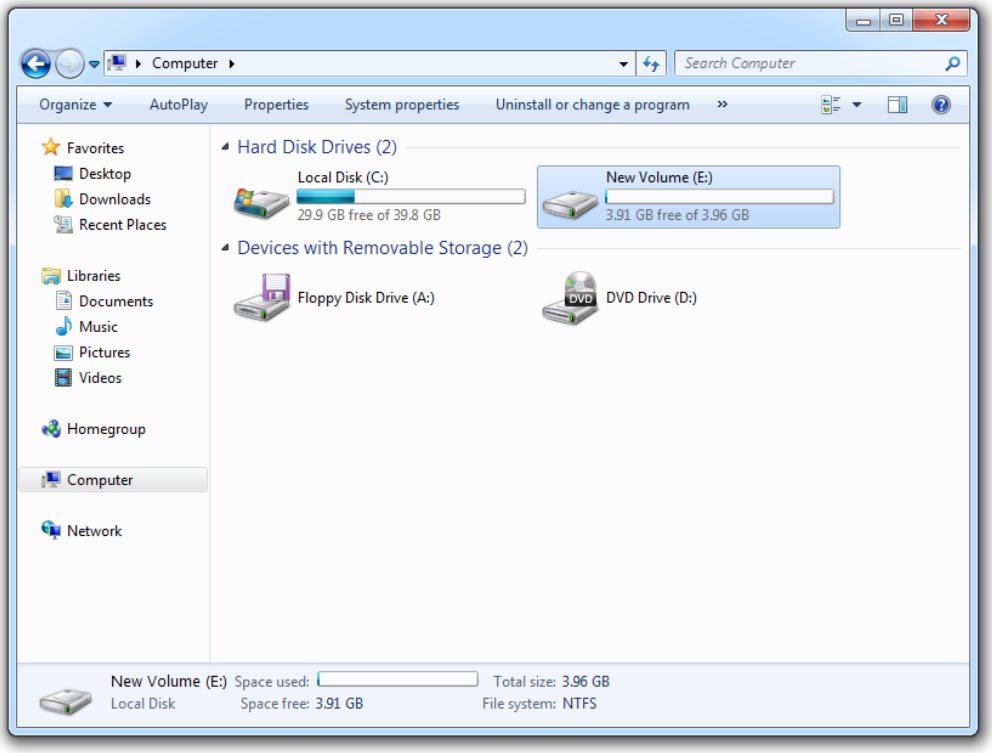


Select GTP for best operation, and click OK.

6. Right click on the new disk and select "New Simple Volume" and follow the prompts. When formatting the partition, change the "Allocation unit size" to 64K as illustrated below:



7. Once the formatting of the iSCSI Target is complete, under "My Computer", the iSCSI disk will now be part of your system with an allocated drive letter. It now can be used to store any of your data on the iSCSI Target.

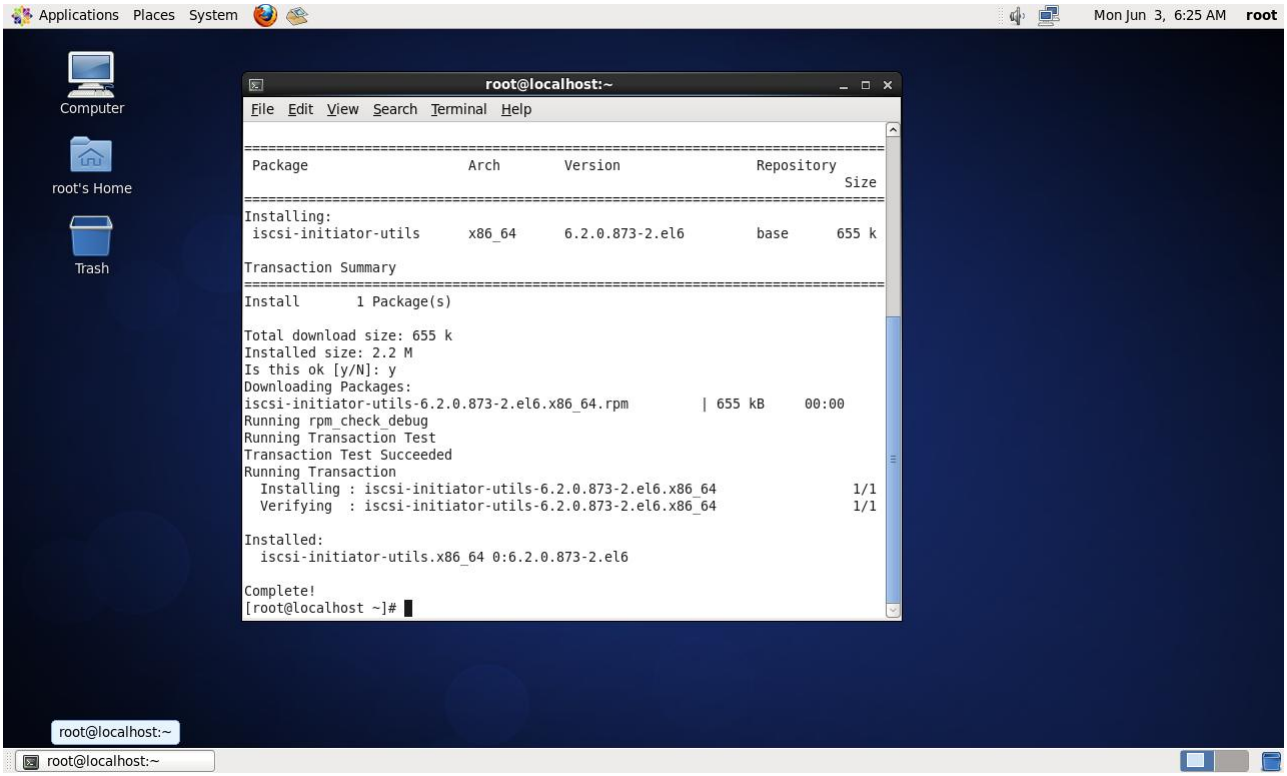


For further details regarding the Microsoft Windows iSCSI Initiator, refer to the Microsoft iSCSI Initiator Step-by-Step Guide at http://technet.microsoft.com/en-us/library/ee338476(v=ws.10).aspx

Access a MyNAS iSCSI Target from a Linux (RHEL / CentOS / Scientific Linux) system

Follow the steps below for configuring a RHEL / CentOS / Scientific Linux system to access a MyNAS iSCSI Target and utilise it as additional storage:

1. Login to the Linux system with root privileges, or if you have sudo, utilise your existing user account to run the following command "`yum install iscsi-initiator-utils`" as illustrated below:

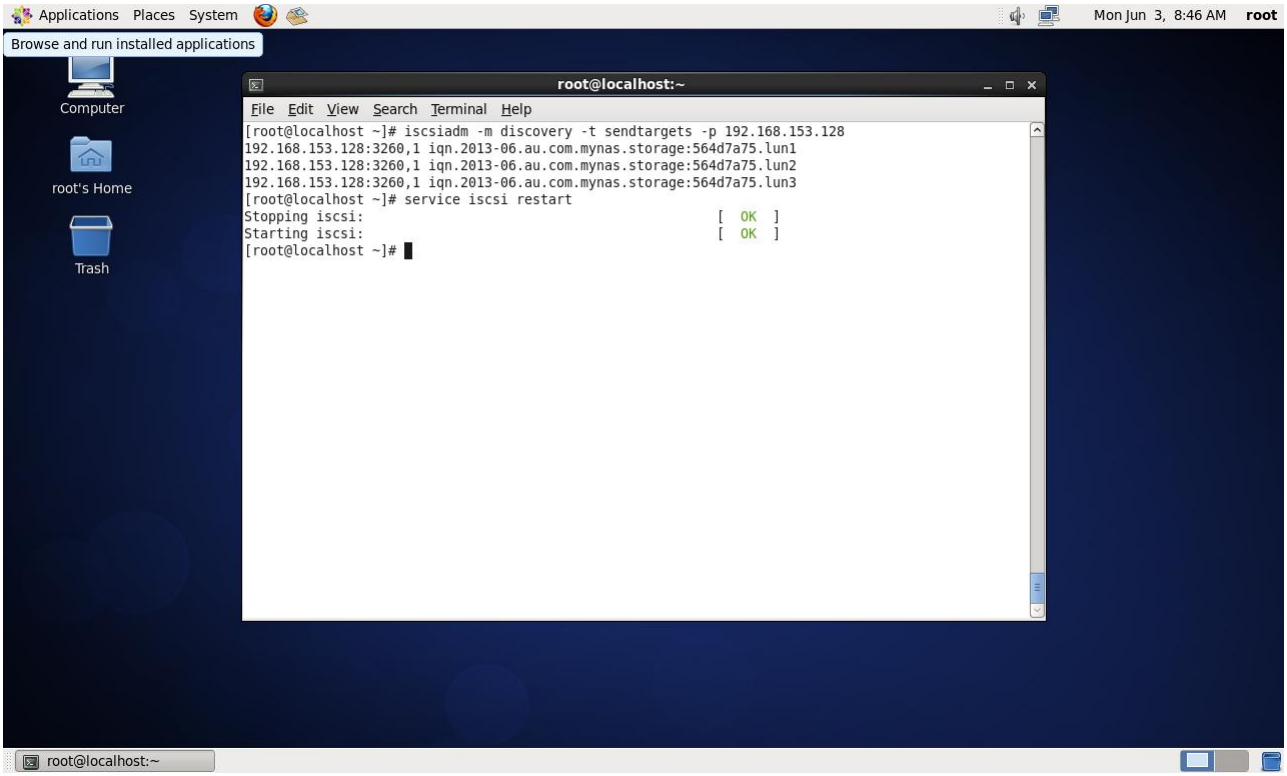


2. From the CLI, configure the iSCSI Initiator Software to discover the available iSCSI Target's on the MyNAS Storage Appliance where:

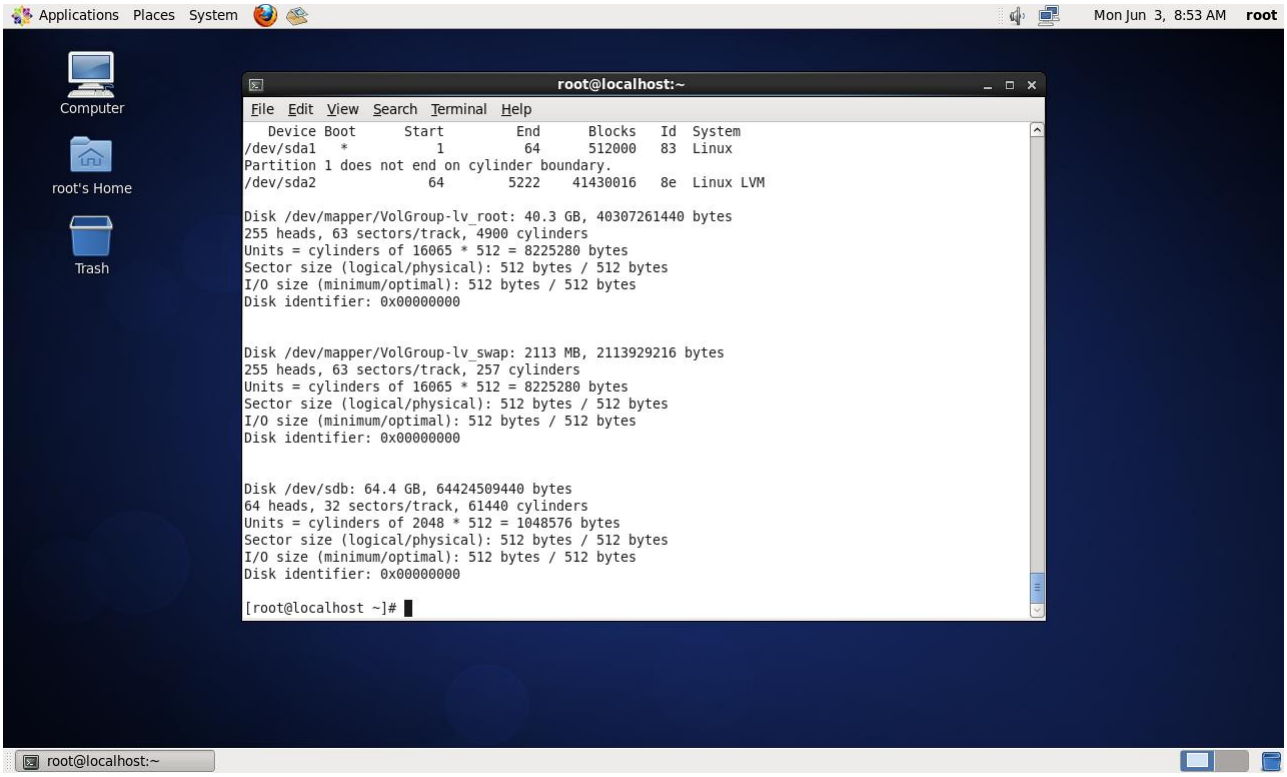
```
iscsiadm -m discovery -t sendtargets -p <ip-address-of-mynas>
```

Once the targets are sent, restart the iSCSI Service:

```
service iscsi restart
```

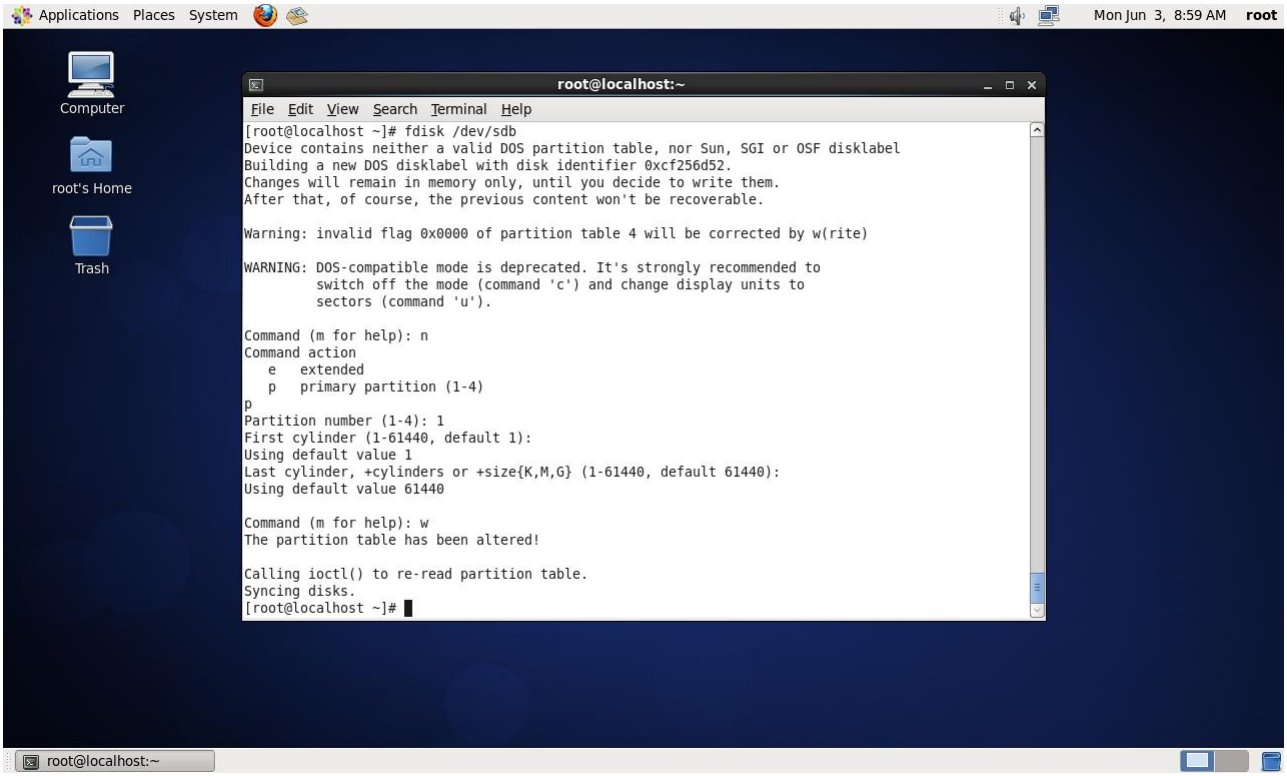


3. From the CLI, obtain the output of command "`fdisk -l`" to see what device name the iSCSI Target was provided. In the example above, the iSCSI Target was given the device name /dev/sdb as illustrated below:



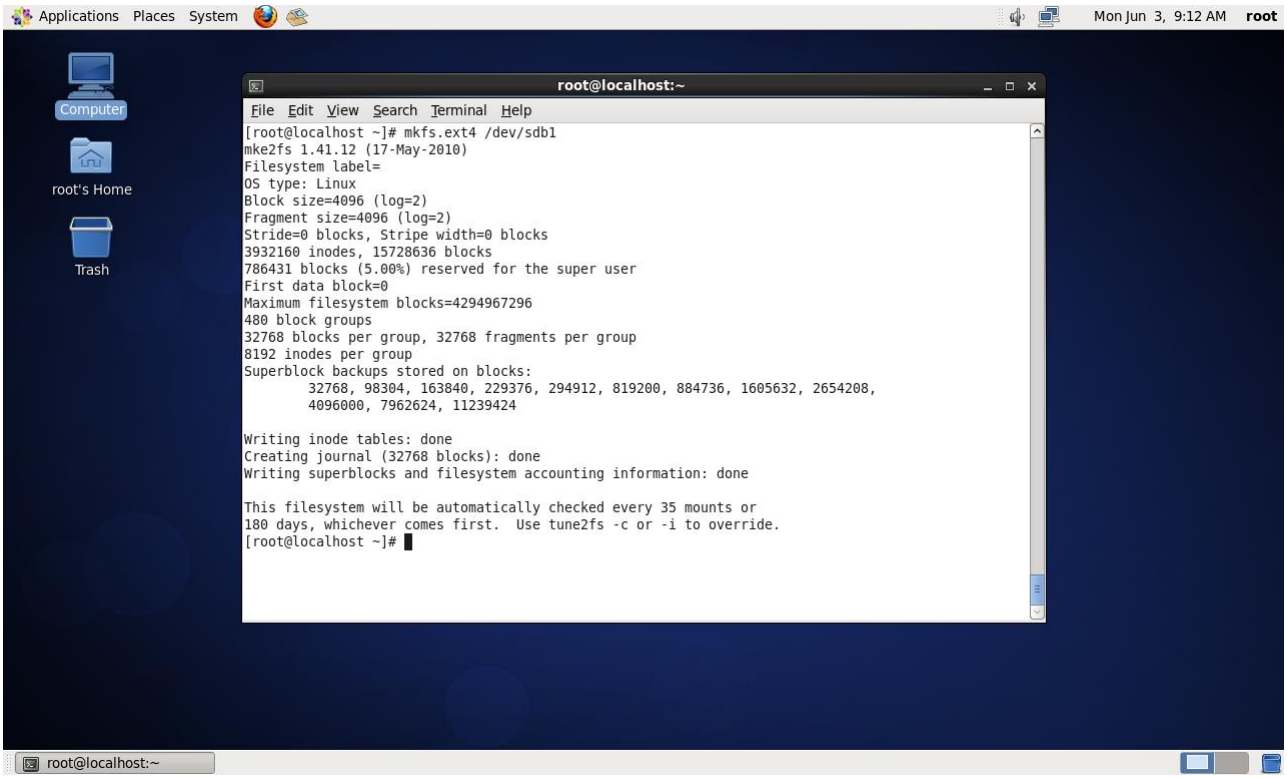
4. Before this iSCSI target can be used, it needs to have a partition created, and formatted. Follow the directions below to create a partition and format the iSCSI Target:

```
[root@localhost ~]# fdisk /dev/sdb
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
Building a new DOS disklabel with disk identifier 0xcf256d52.
Changes will remain in memory only, until you decide to write them.
After that, of course, the previous content won't be recoverable.

Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
         switch off the mode (command 'c') and change display units to
         sectors (command 'u').

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-61440, default 1):<press enter>
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-61440, default 61440): <press enter>
Using default value 61440

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
[root@localhost ~]#
```


Applications Places System
Mon Jun 3, 8:59 AM root
Computer
root's Home
Trash
root@localhost:~
File Edit View Search Terminal Help
[root@localhost ~]# fdisk /dev/sdb
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
Building a new DOS disklabel with disk identifier 0xcf256d52.
Changes will remain in memory only, until you decide to write them.
After that, of course, the previous content won't be recoverable.
Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)
WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
switch off the mode (command 'c') and change display units to
sectors (command 'u').
Command (m for help): n
Command action
e extended
p primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-61440, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-61440, default 61440):
Using default value 61440
Command (m for help): w
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.
[root@localhost ~]#
root@localhost:~

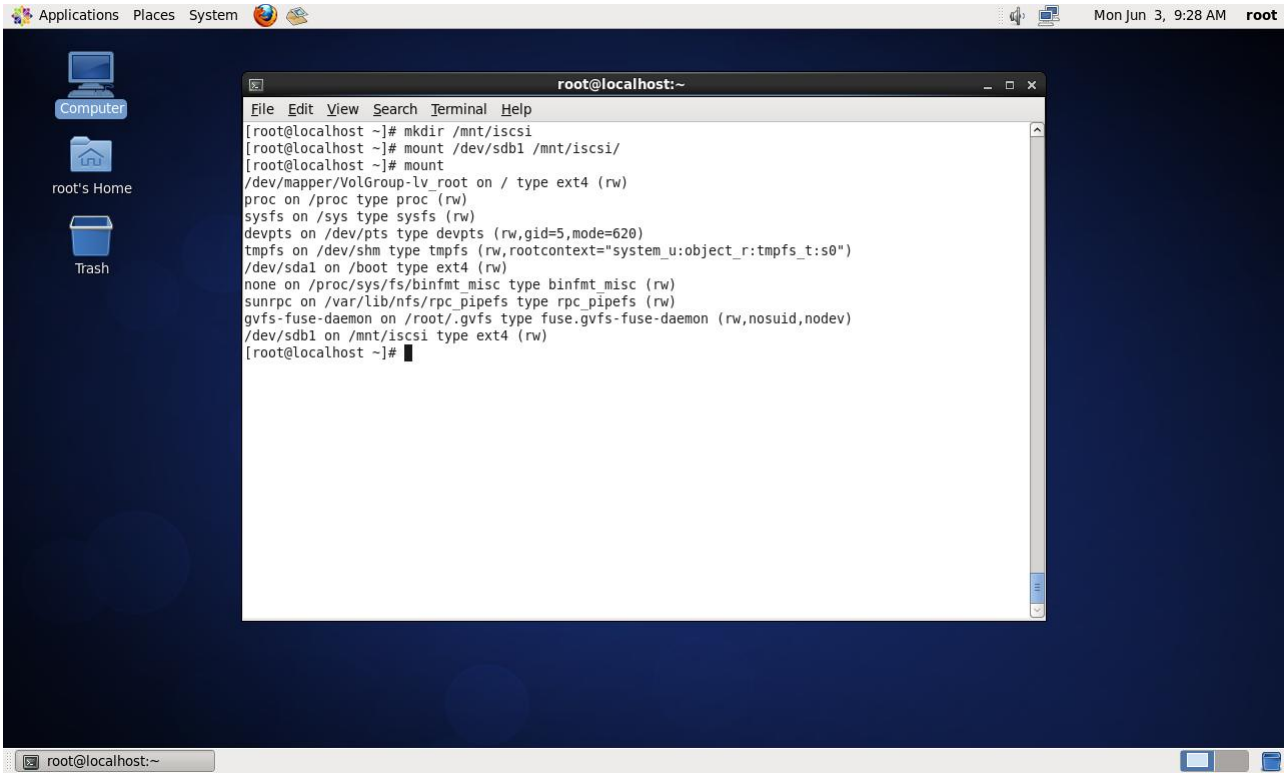
5. Create a usable filesystem on the new partition using the following command:

```
mkfs.ext4 /dev/sdb1
```

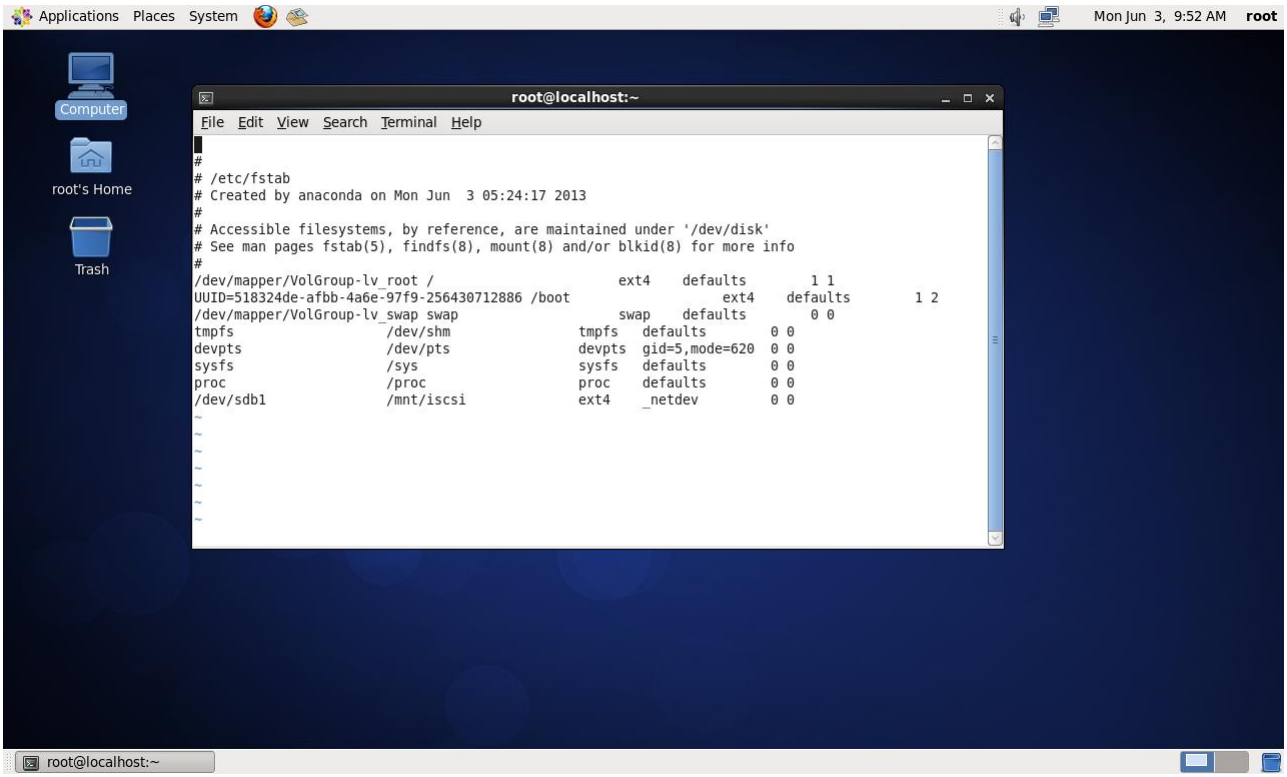


6. Create an applicable mount point for the iSCSI Target on the system, and mount the /dev/sdb1 formatted file system to the mount point:

```
mkdir /mnt/iscsi
mount /dev/sdb1 /mnt/iscsi
```



7. To mount the iSCSI Target automatically on the system when it is rebooted, append to the end of the `/etc/fstab` file following configuration:

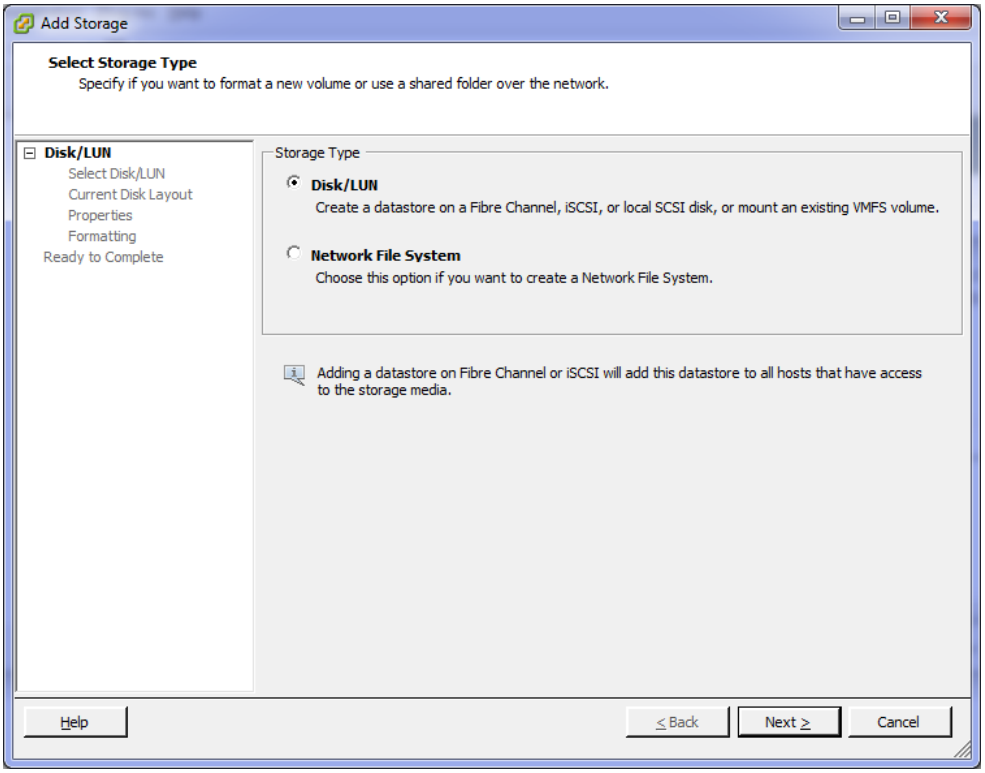


8. After any future reboot of the Linux OS, the iSCSI Target will be automatically mounted. The iSCSI Target can now be used to store data as required.

Access a MyNAS iSCSI Target from VMware ESXi

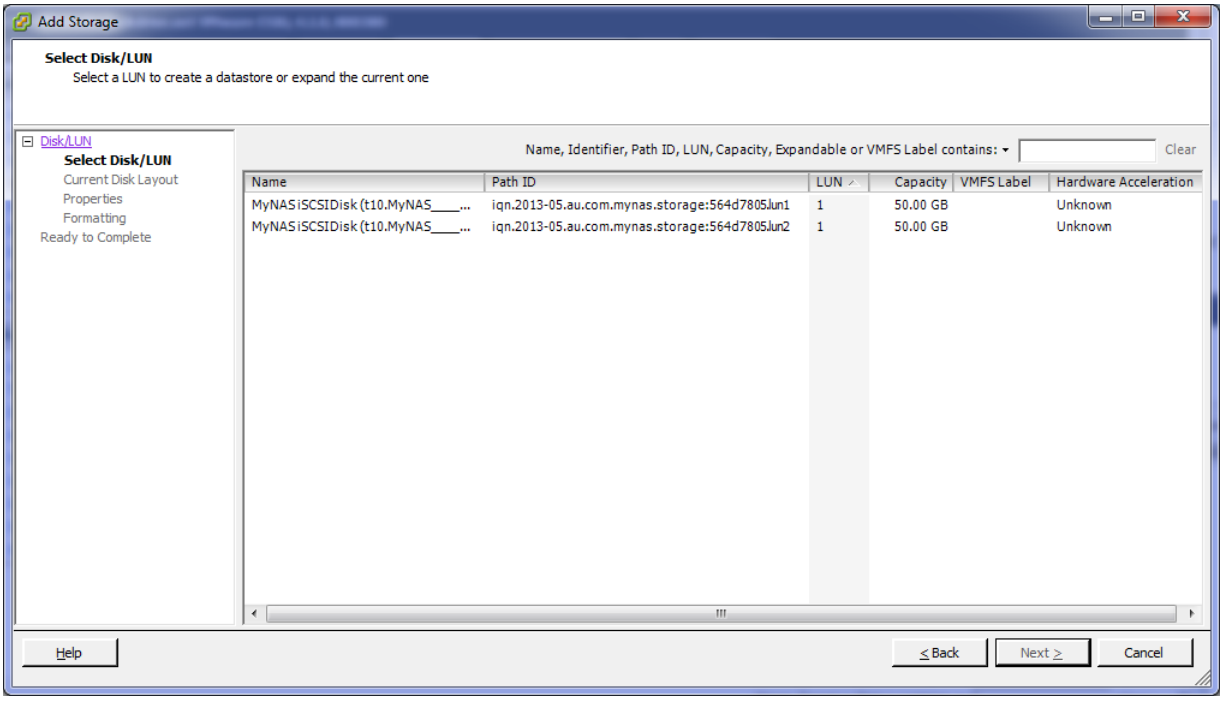
Follow the steps below for configuring VMware ESXi to access a MyNAS iSCSI Target and utilise it as an additional datastore:

1. Open the VMware vSphere client and log into the VMware ESXi server with appropriate privileges which can add a new datastore storage device
2. From the vSphere client, select the top root server, then the Configuration Tab, then Storage Adaptors on the left hand side.
3. Scroll down in the "Storage Adaptors" window until you see the "iSCSI Software Adaptor". Click on this item, and in the Details window below, click Properties.
4. If this is the first time configuring the iSCSI Initiator for VMware ESXi, click the Configure button, and then check the "Enabled" box, then click OK.
5. Click on the "Dynamic Discovery" tab and click "Add". Type in the IP address of the MyNAS storage appliance and click OK. Once completed, click close.
6. A prompt will appear to rescan the host bus adaptor. Click yes.
7. From the vSphere client, select the top root server, then the Configuration Tab, then Storage on the left hand side.
8. Above the Datastores view, click the "Add Storage..." text to add additional storage to this ESXi host. A storage configuration wizard will appear as per below:



Select Disk/LUN and click Next.

9. The wizard will now display the available iSCSI Targets for ESXi to use as illustrated below:



10. Select the appropriate iSCSI Target to use for the ESXi VMFS Datastore and click Next.
11. As this is a new iSCSI Target, it will be blank and will need to be formatted. Click Next.
12. Give the new datastore a name, and click Next.
13. Select the appropriate maximum file size. Refer to VMware ESXi documentation as to how to determine the correct size for your use. Once selected, click Next, and then Finish.
14. VMware ESXi will now format the iSCSI Target, and make the datastore available for VMware ESXi to utilise.

Modifying an iSCSI Target

Modifying an iSCSI Target provides two options

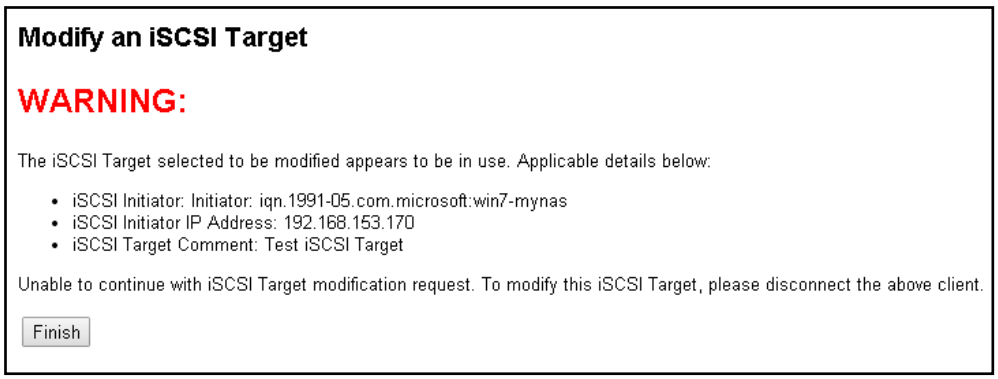
1. Extend an iSCSI Target in size
2. Add an additional iSCSI Target to the existing logical unit

In the first case, this is useful when you are running short on space for the iSCSI Target, and need to allocate more space to the system which is utilising that particular iSCSI Target

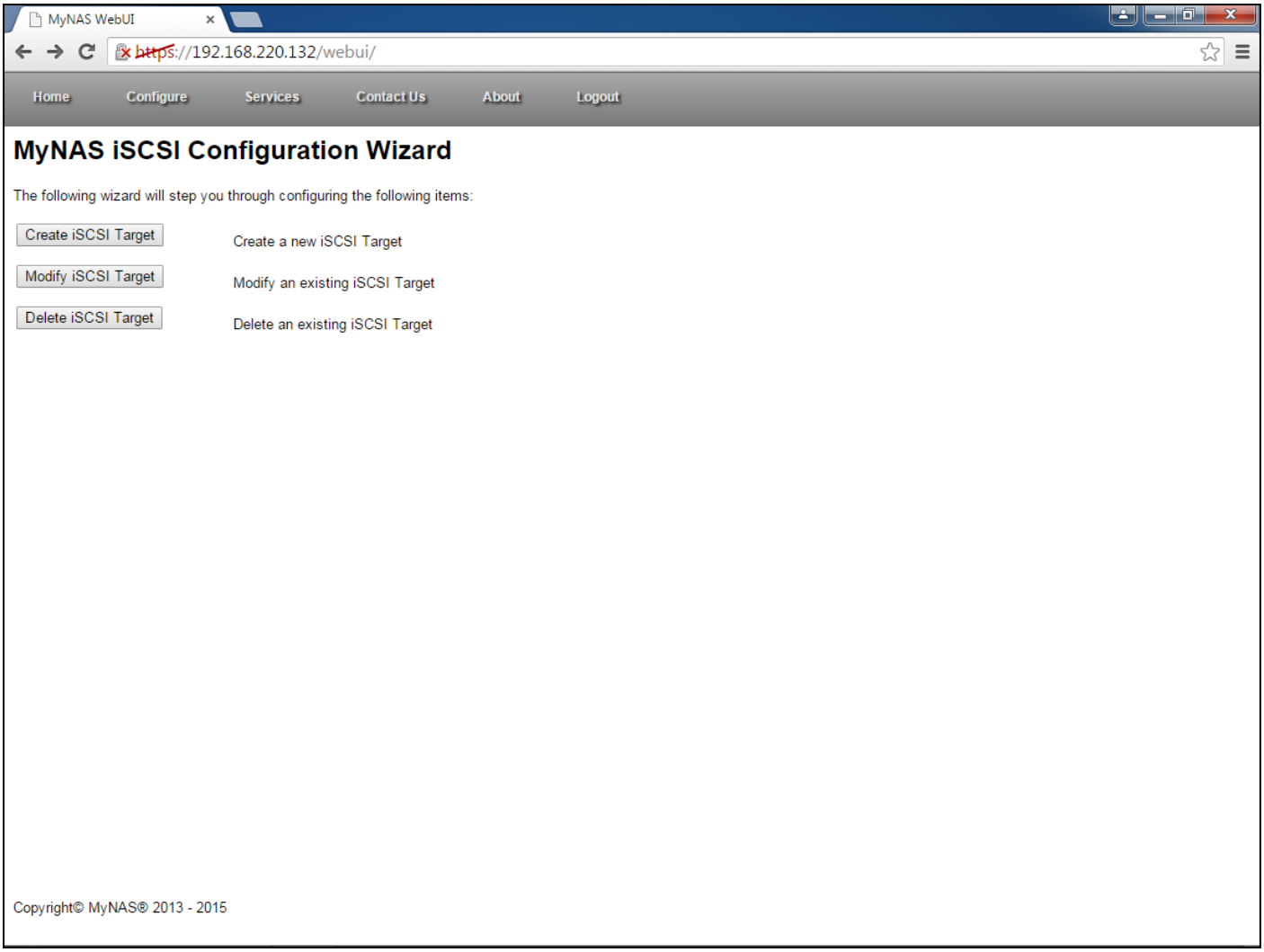
In the second case, this can be useful of you need additional disks associated with the particular iSCSI Target - for example you wish to create a mirror of data on your file system using iSCSI

Follow the directions below to perform an iSCSI modification.

Note: Before modifying an iSCSI Target, the actual target that will be modified will need to be disconnected on the host that is currently using iSCSI Target. If not, a warning similar to below will be presented:

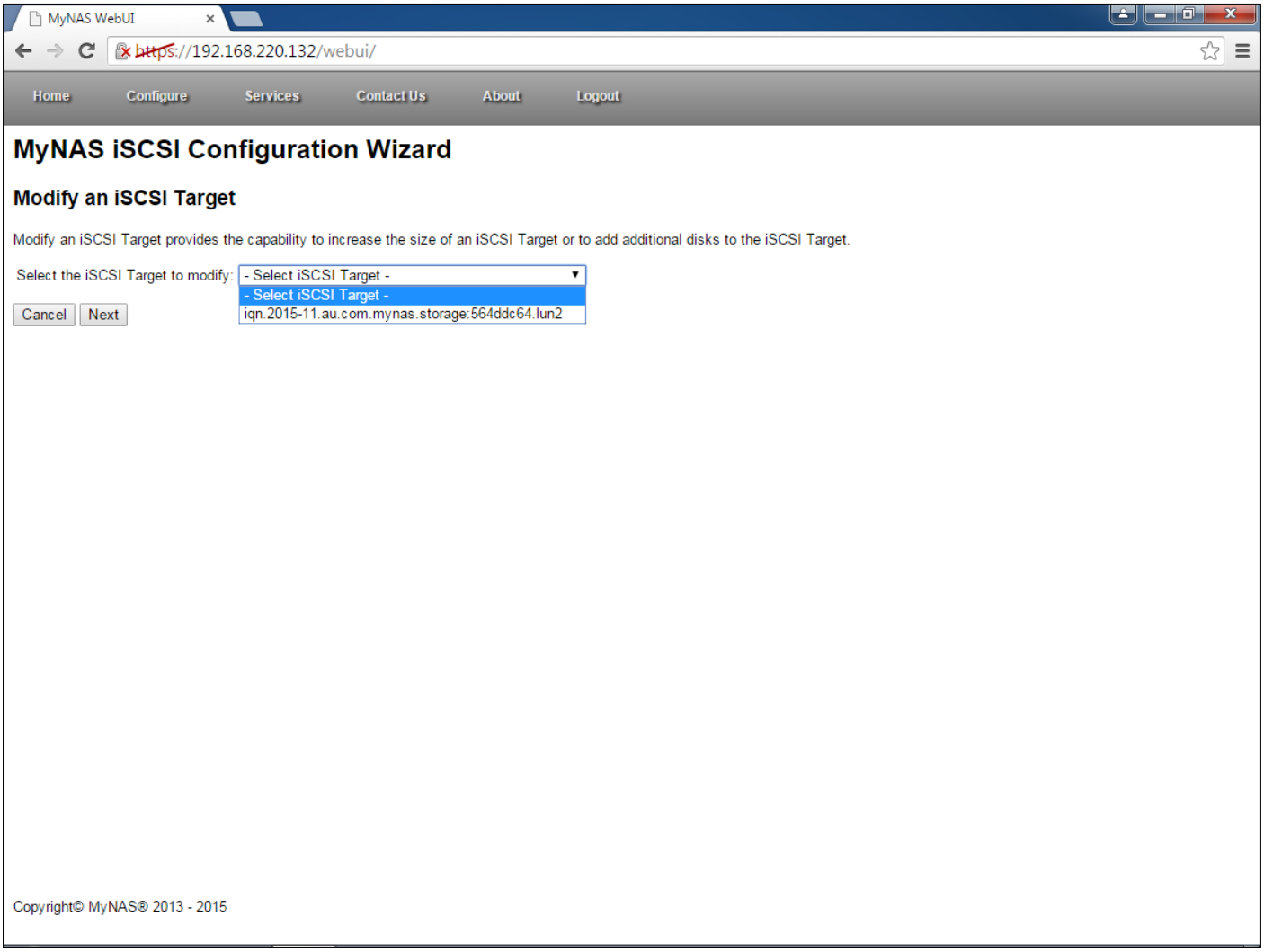


Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure iSCSI Targets'. Once selected, the following will be displayed:



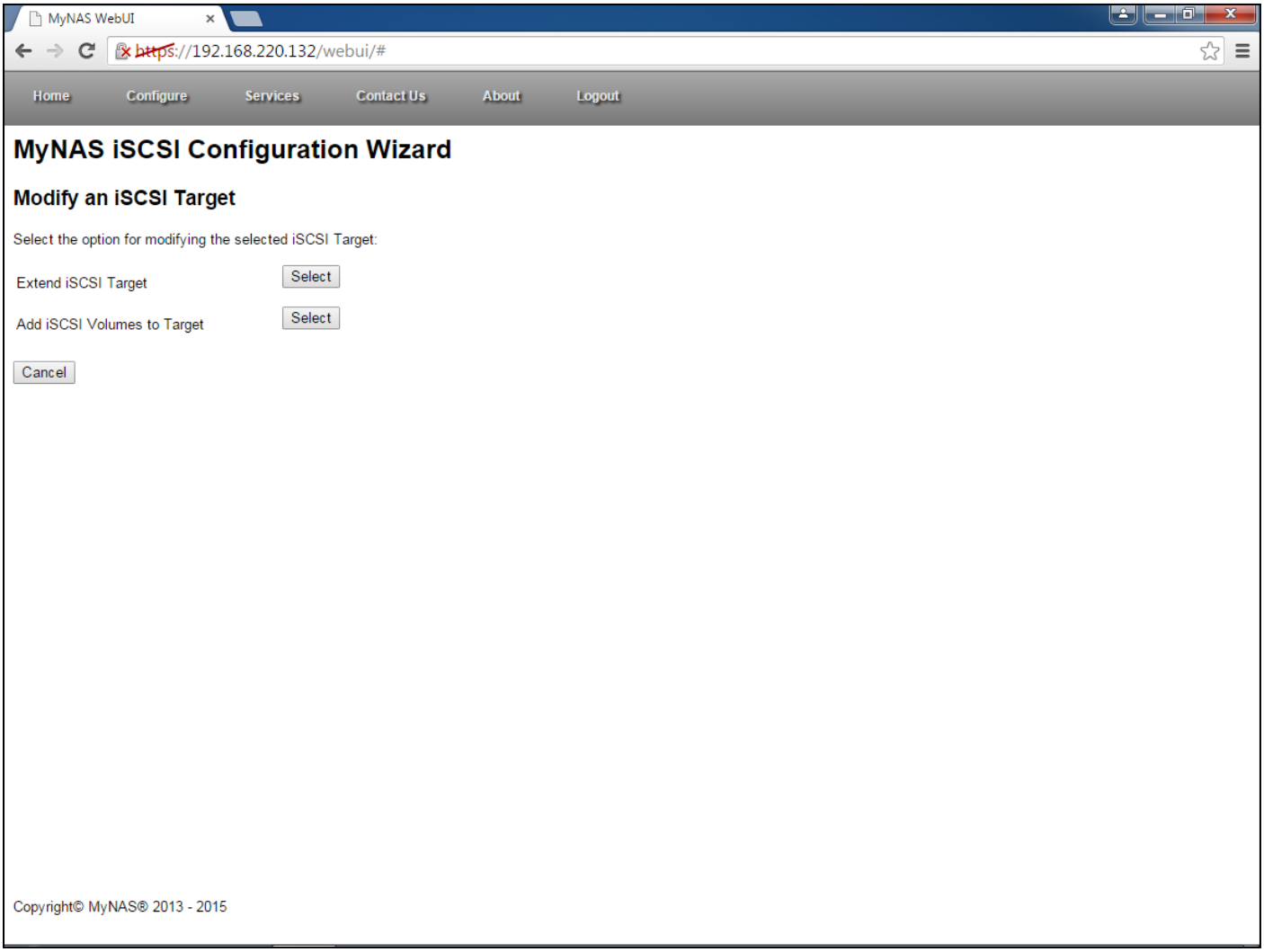
Click the 'Modify iSCSI Target' to modify an iSCSI Target

Select the iSCSI target to modify:

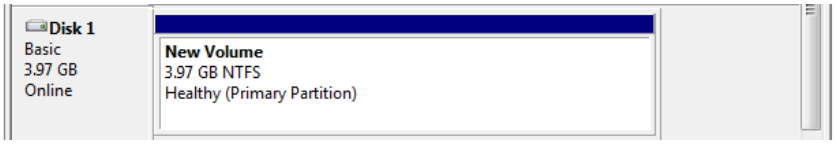


Once the iSCSI Target to modify is selected, click 'Next'

Select the type of modification you wish to perform

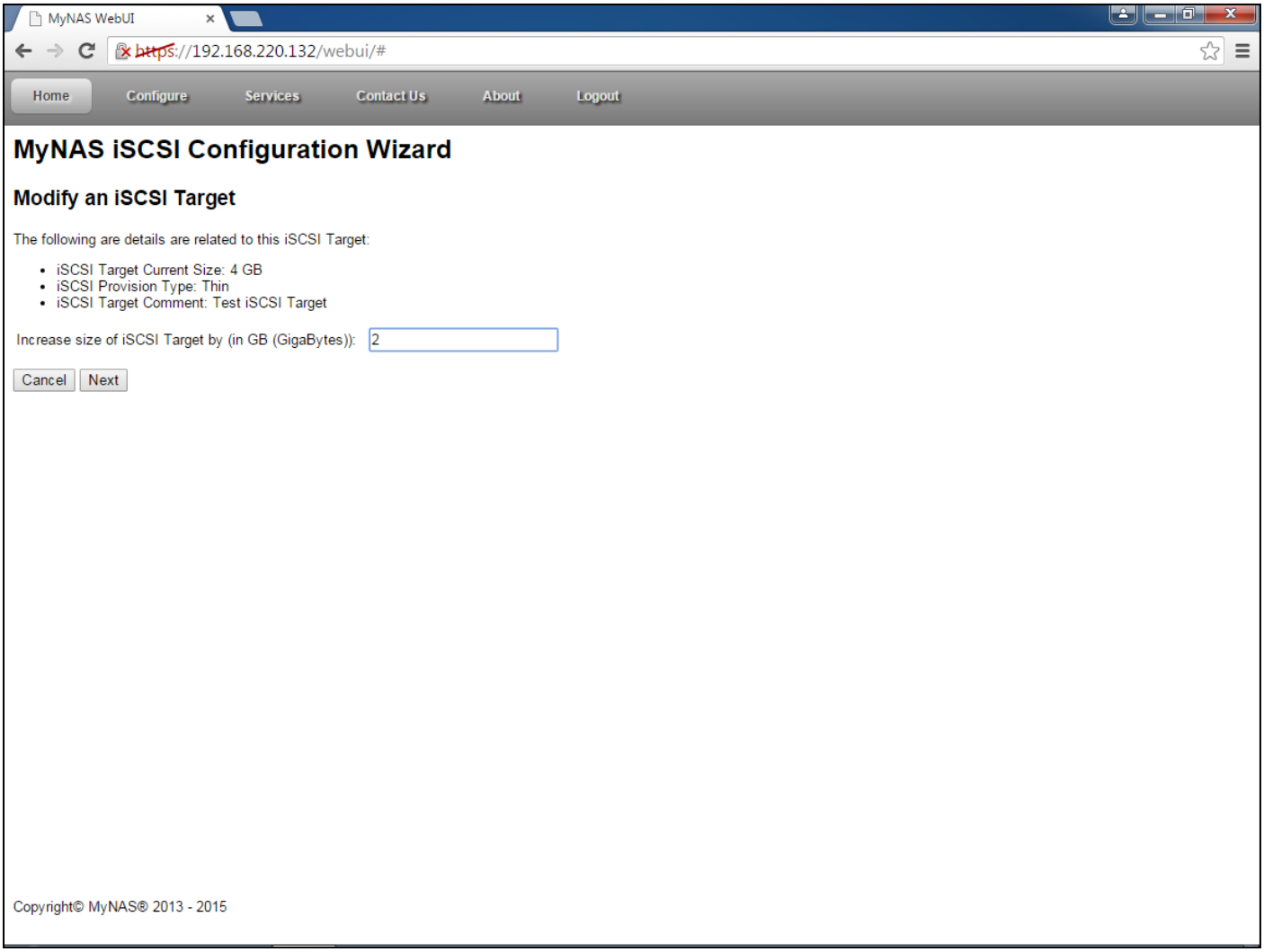


For this exercise, we will extend the existing iSCSI target. The current iSCSI Target is a 4GB sized target, assigned to a Windows system as illustrated below:

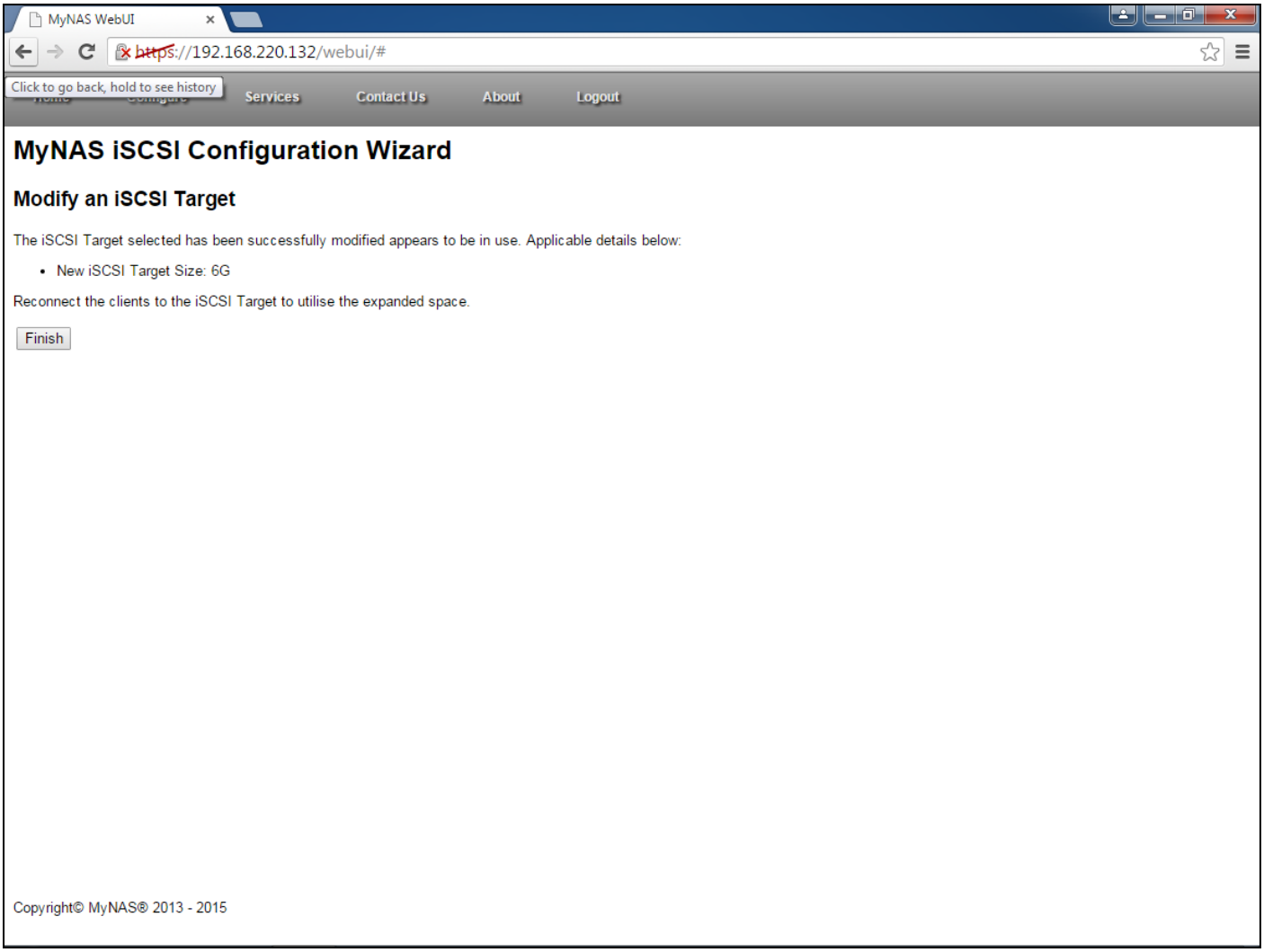


From the MyNAS WebUI, click the Select button to Extend the iSCSI Target

Type in the size to increase the iSCSI Target by:

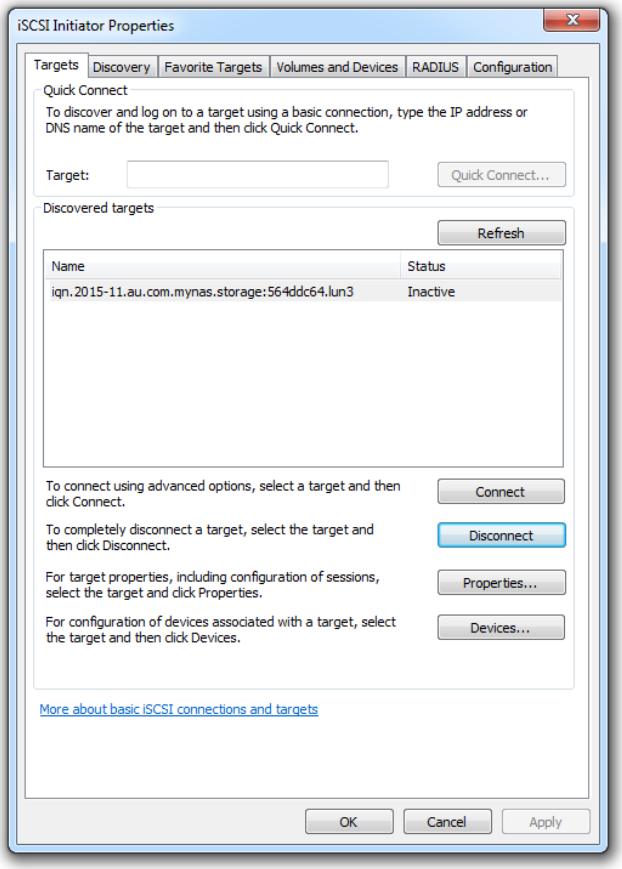


Click 'Next' and the iSCSI Target will be increased by the selected GB.



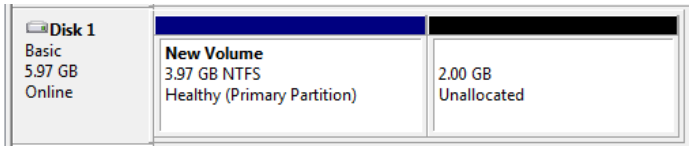
Click 'Finish' to complete the modification task.

In Windows, re-connect the iSCSI Target using the iSCSI Initiator Properties:

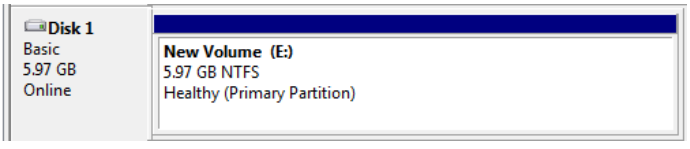


Click the 'Connect' button to reconnect to the modified iSCSI Target.

Once reconnected, open up the Computer Management MMC to utilise the additional storage space



Right click on the iSCSI volume, and select to Extend Volume. Follow the wizard prompts to extend the volume to utilise the additional storage provisioned. Once extended, the new total size (6GB) should be usable by the Windows system:

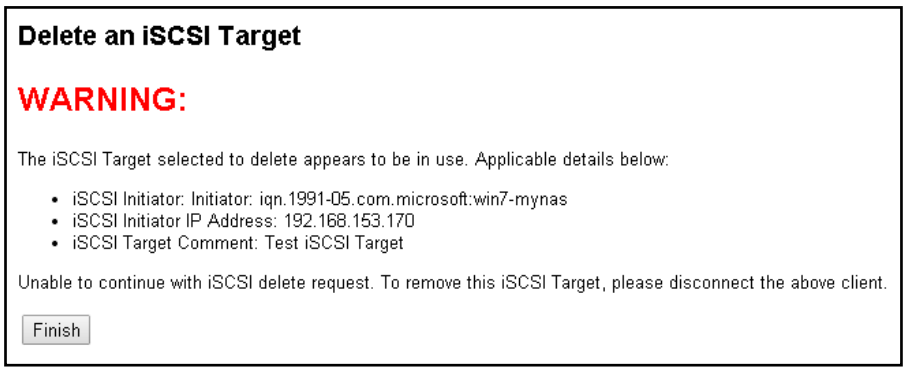


Follow the same approach to perform further increases, or to add additional volumes to the same iSCSI Target.

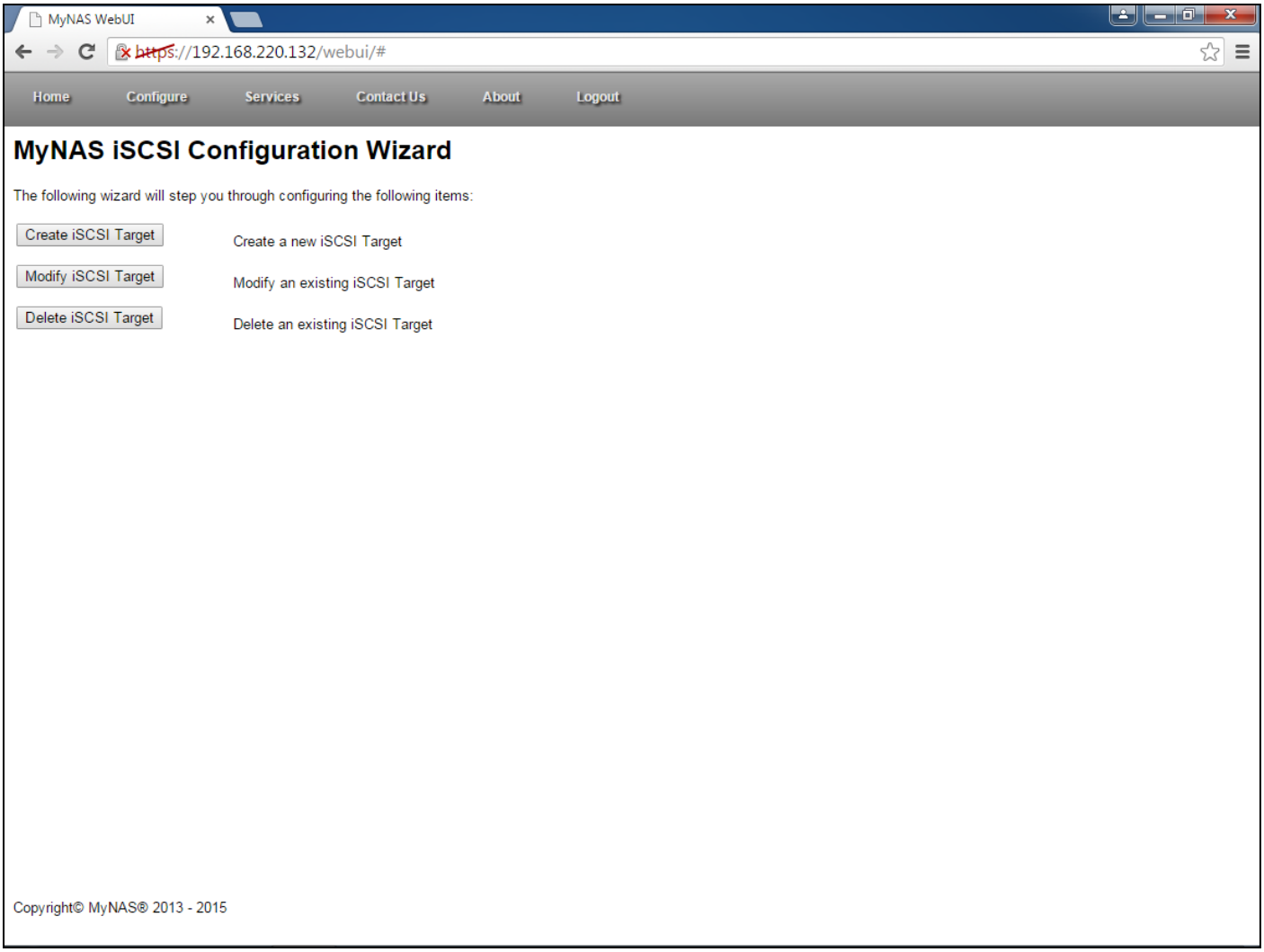
Delete an iSCSI Target

Deleting an iSCSI Target is a destructive process for your data. Follow the directions below to delete an iSCSI Target.

Note: Before deleting an iSCSI Target, the actual target that will be deleted will need to be disconnected on the host that is currently using iSCSI Target. If not, a warning similar to below will be presented:

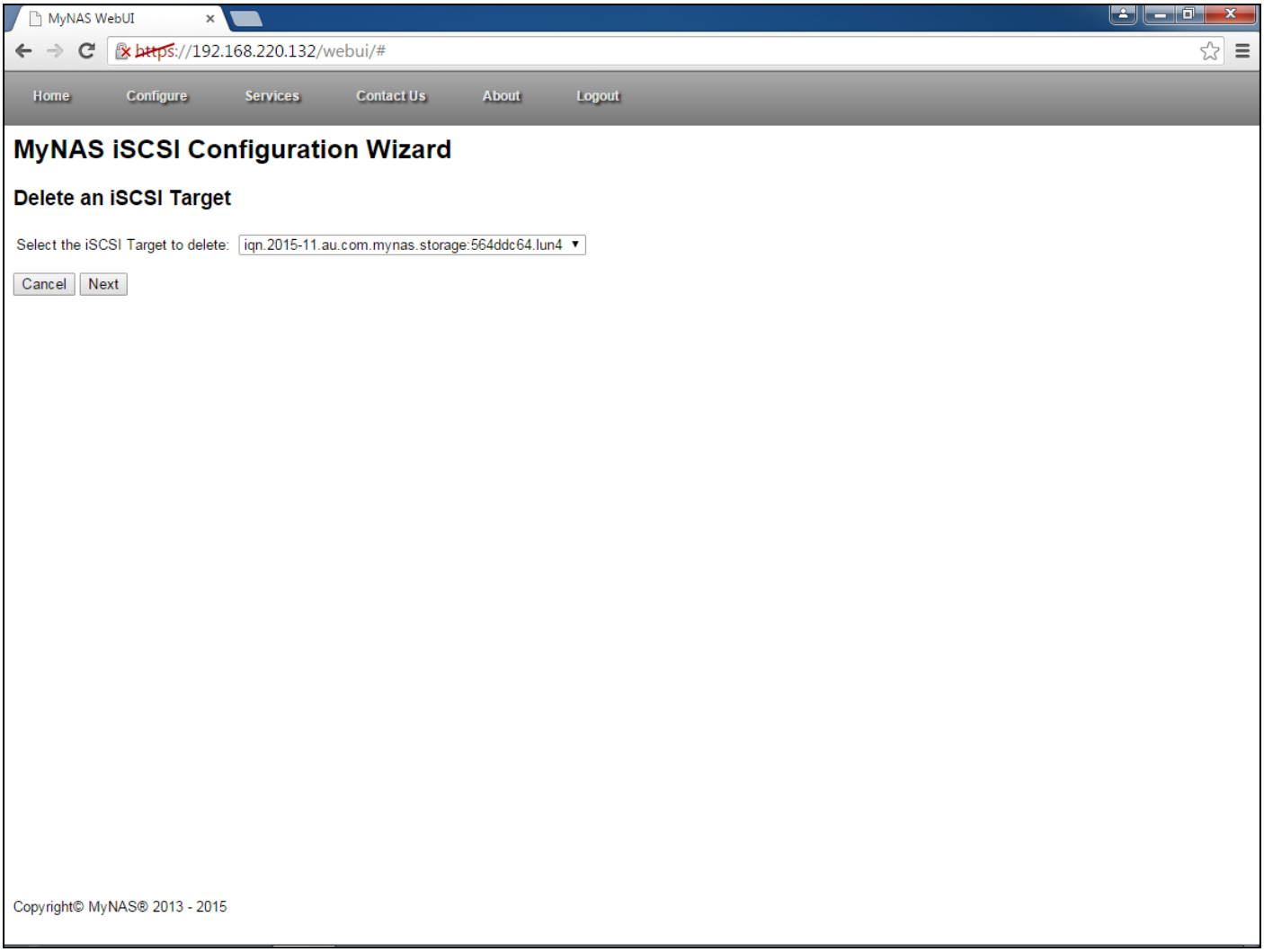


Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure iSCSI Targets'. Once selected, the following will be displayed:

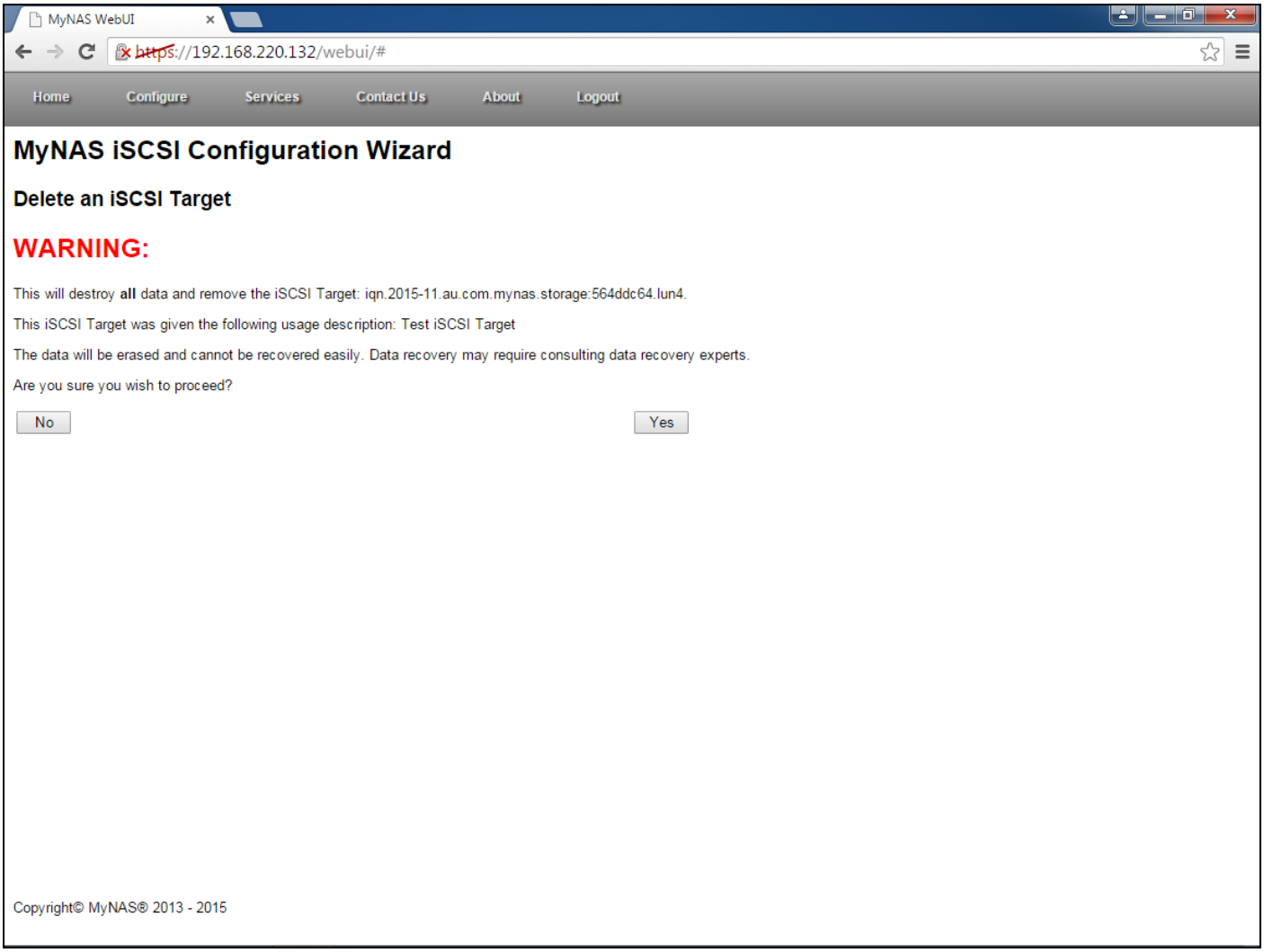


Click 'Delete iSCSI Target' to perform the delete operation

Select the iSCSI Target to delete and click 'Next'

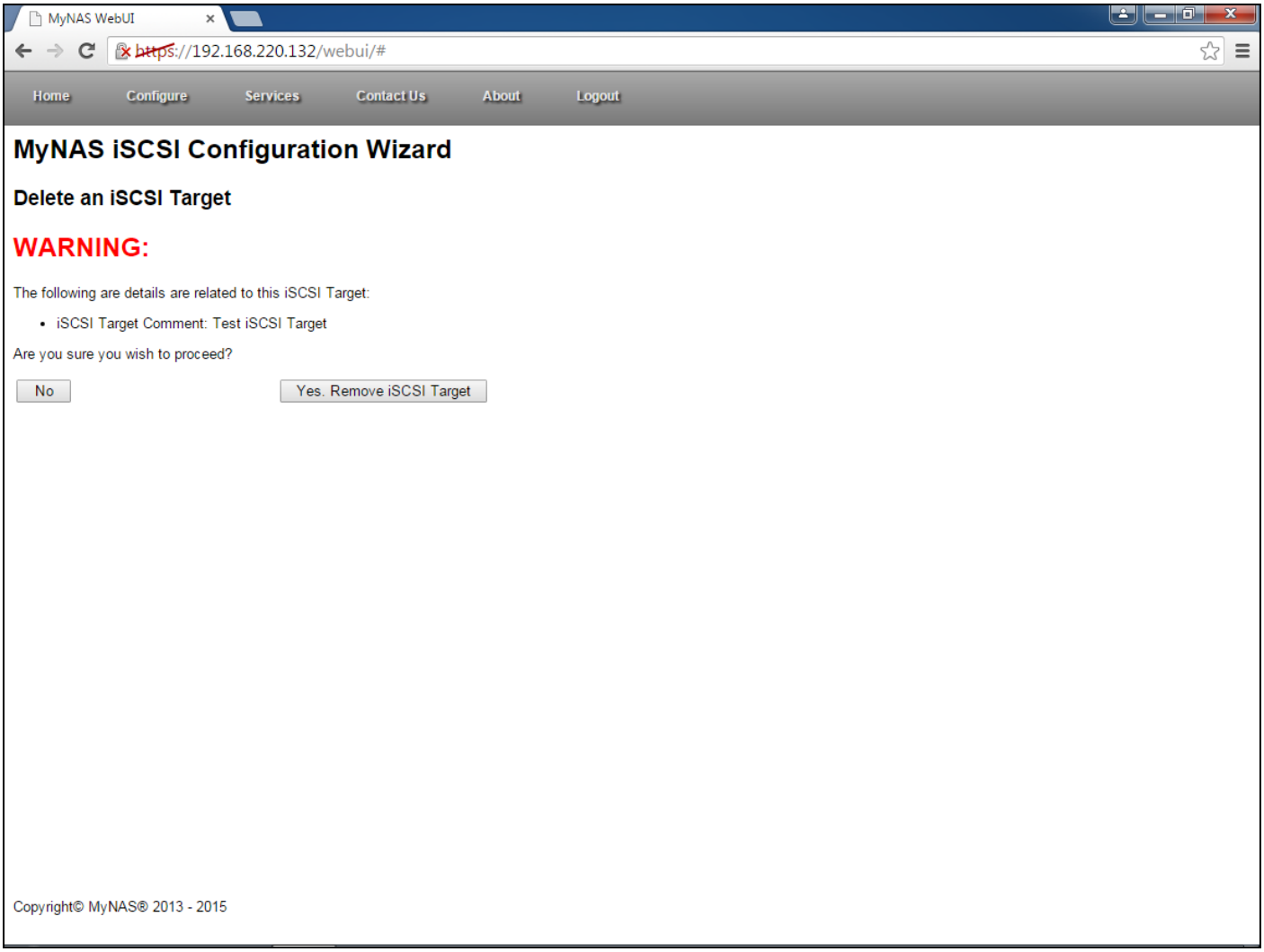


A warning will be displayed about the destructive nature of this operation. Details about this specific iSCSI Target will also be displayed:

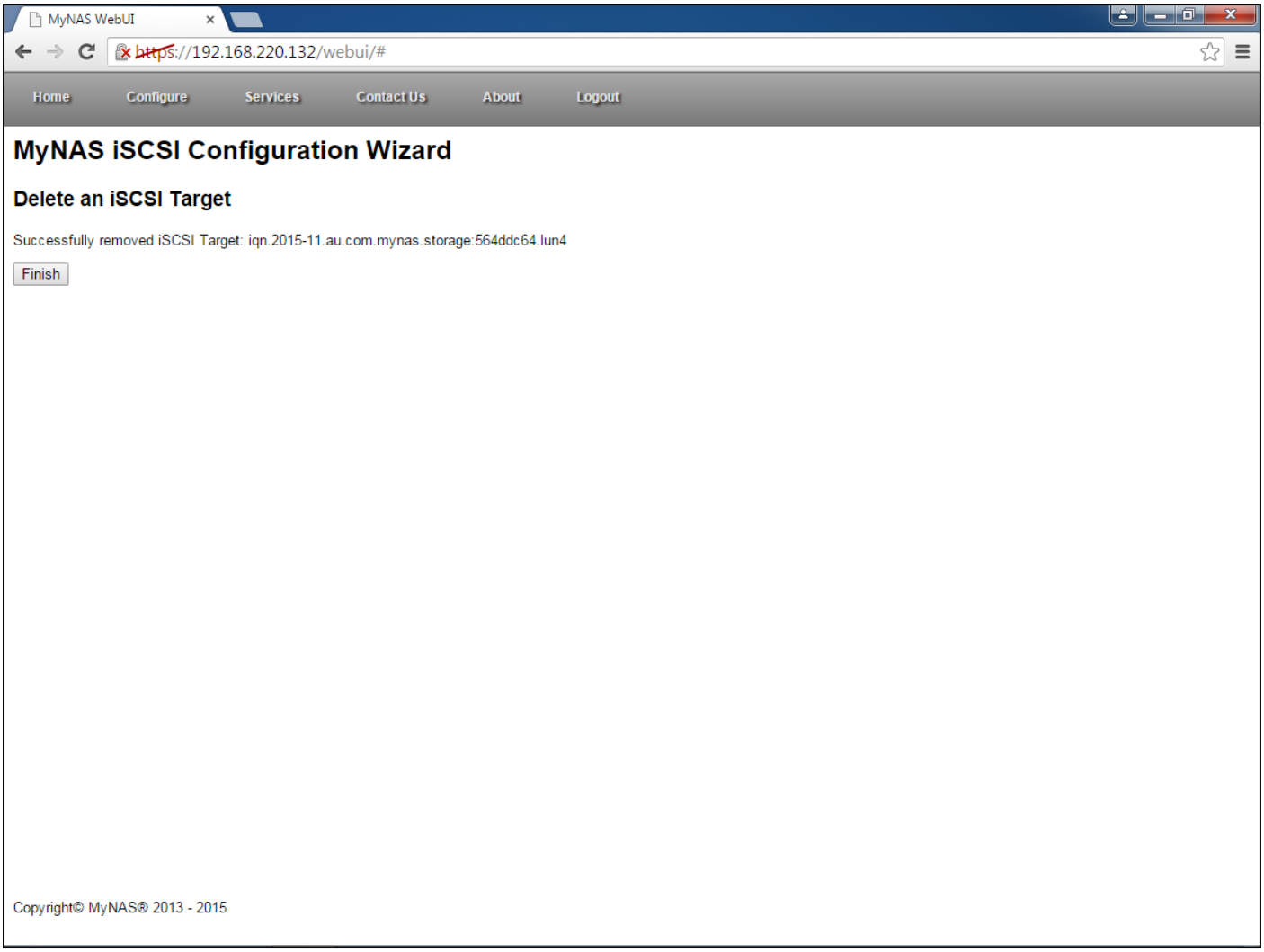


If you are sure that this is the iSCSI Target to remove, click 'Yes' to continue

MyNAS will now confirm that you wish to remove this iSCSI Target:



Click 'Yes. Remove iSCSI Target' to complete the iSCSI Target removal.



Click 'Finish' to complete removing the iSCSI Target.

Configuring MyNAS® Storage Appliance Data Share Authentication

When accessing Data Shares, MyNAS has the option of providing the network shares with the following security profiles

- All network users have full control
- Utilise local users and groups to control read and write operations
- Utilise Active Directory to control read and write operations

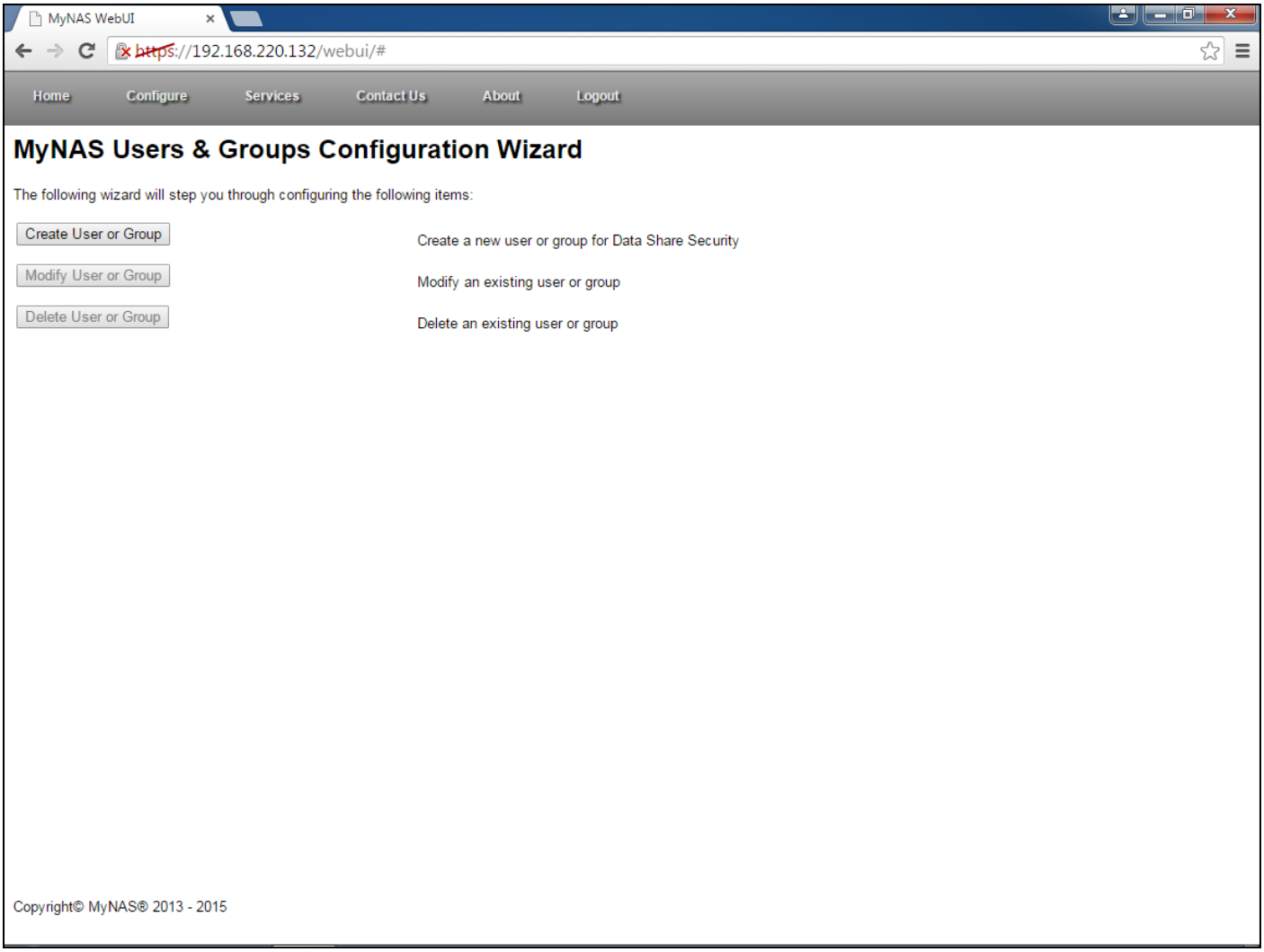
Authentication can be configured at any time, with the capability to re-configure the Data Shares with any new permission requirements.

Configuring Local Users and Groups for Data Share access

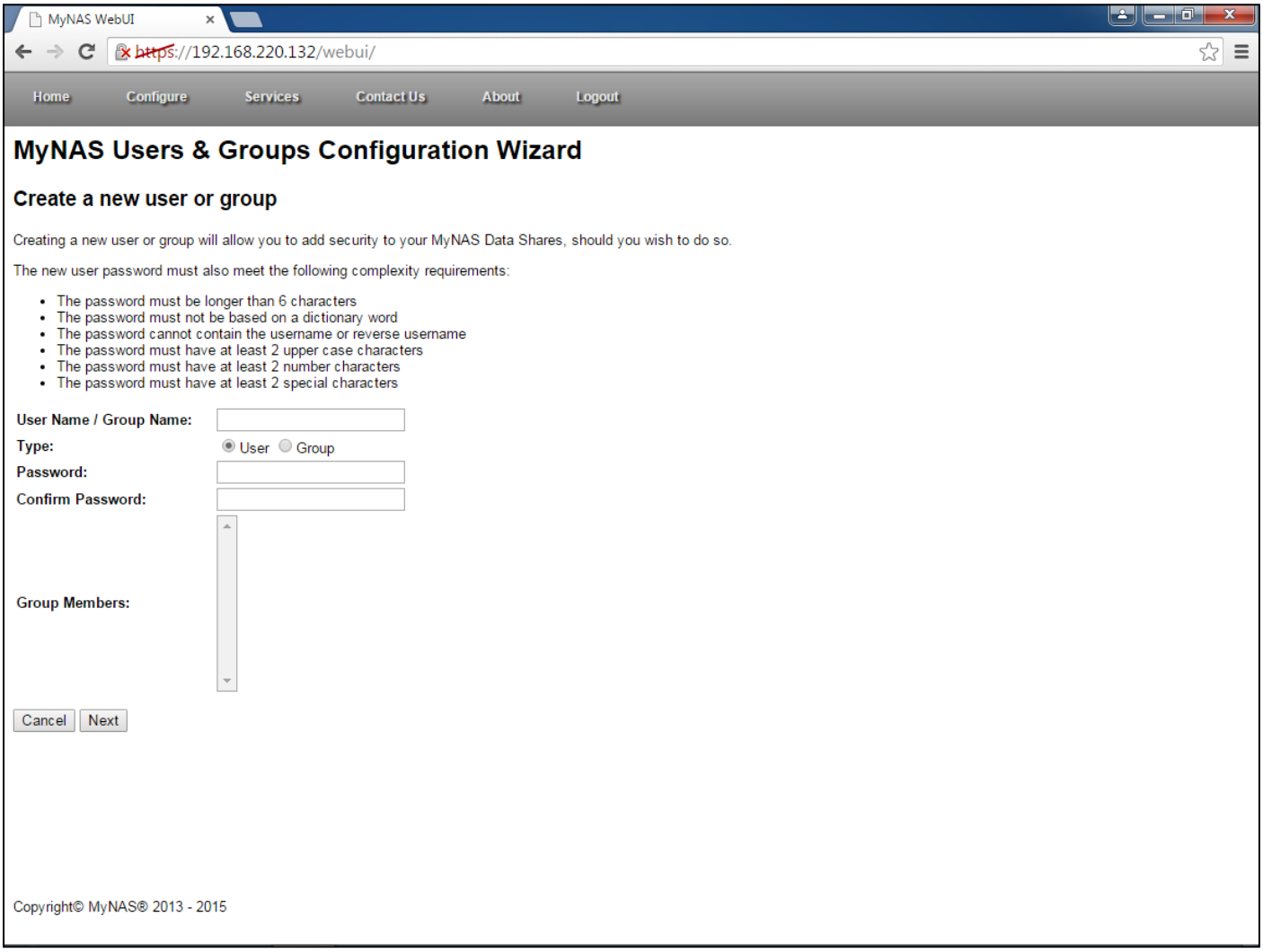
By configuring local users and groups, these user and groups can be used to control access permissions to the Data Shares on MyNAS. Follow the directions below to create, modify and delete local users and groups.

Creating MyNAS Local Users and Groups

To configure local users or groups, login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Users & Groups'. Once selected, the following will be displayed:



To create a user, click on the 'Create User or Group' button, and the following will be displayed:

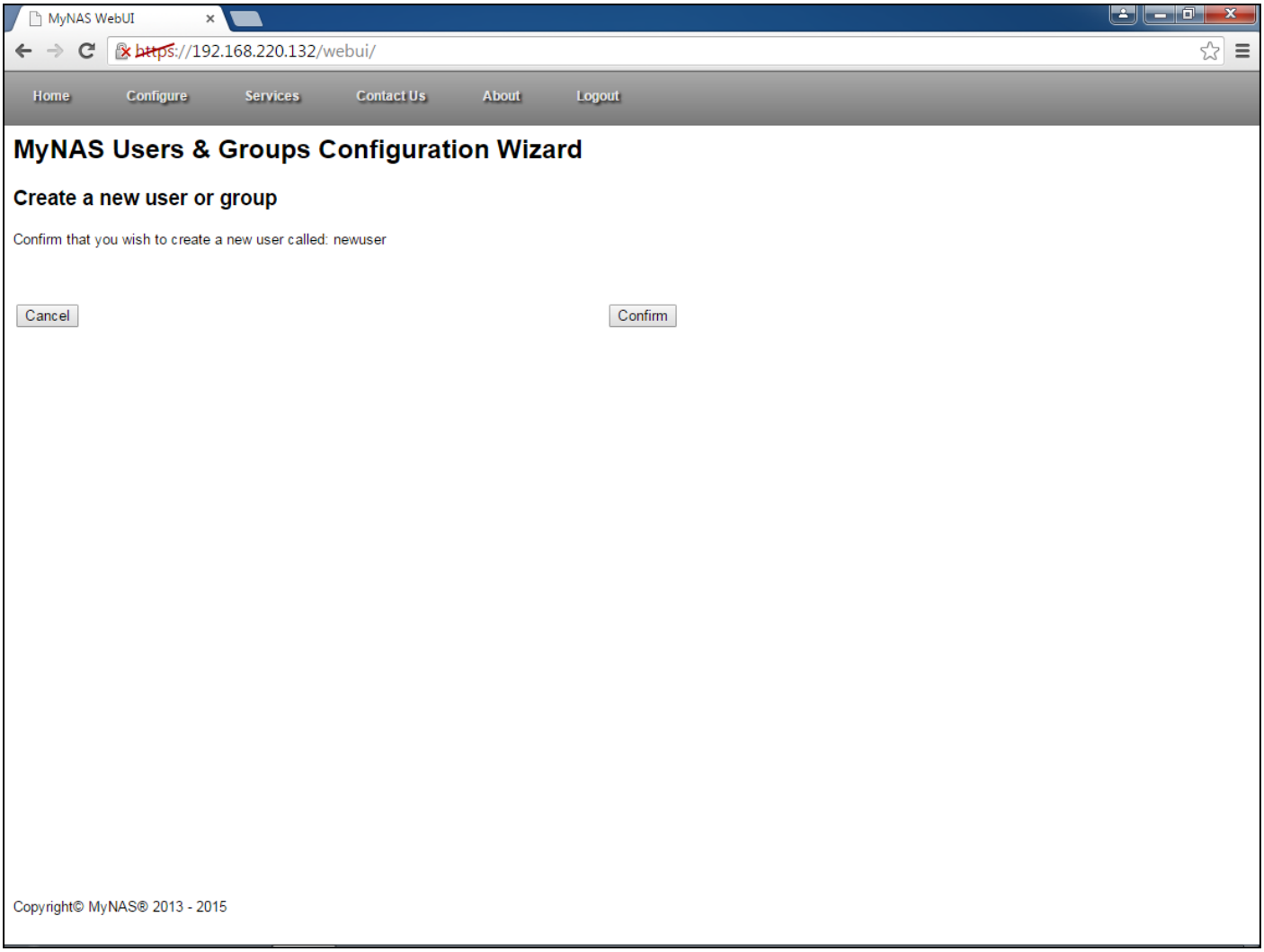


Type in the required details for this user or group, and click 'Next'.

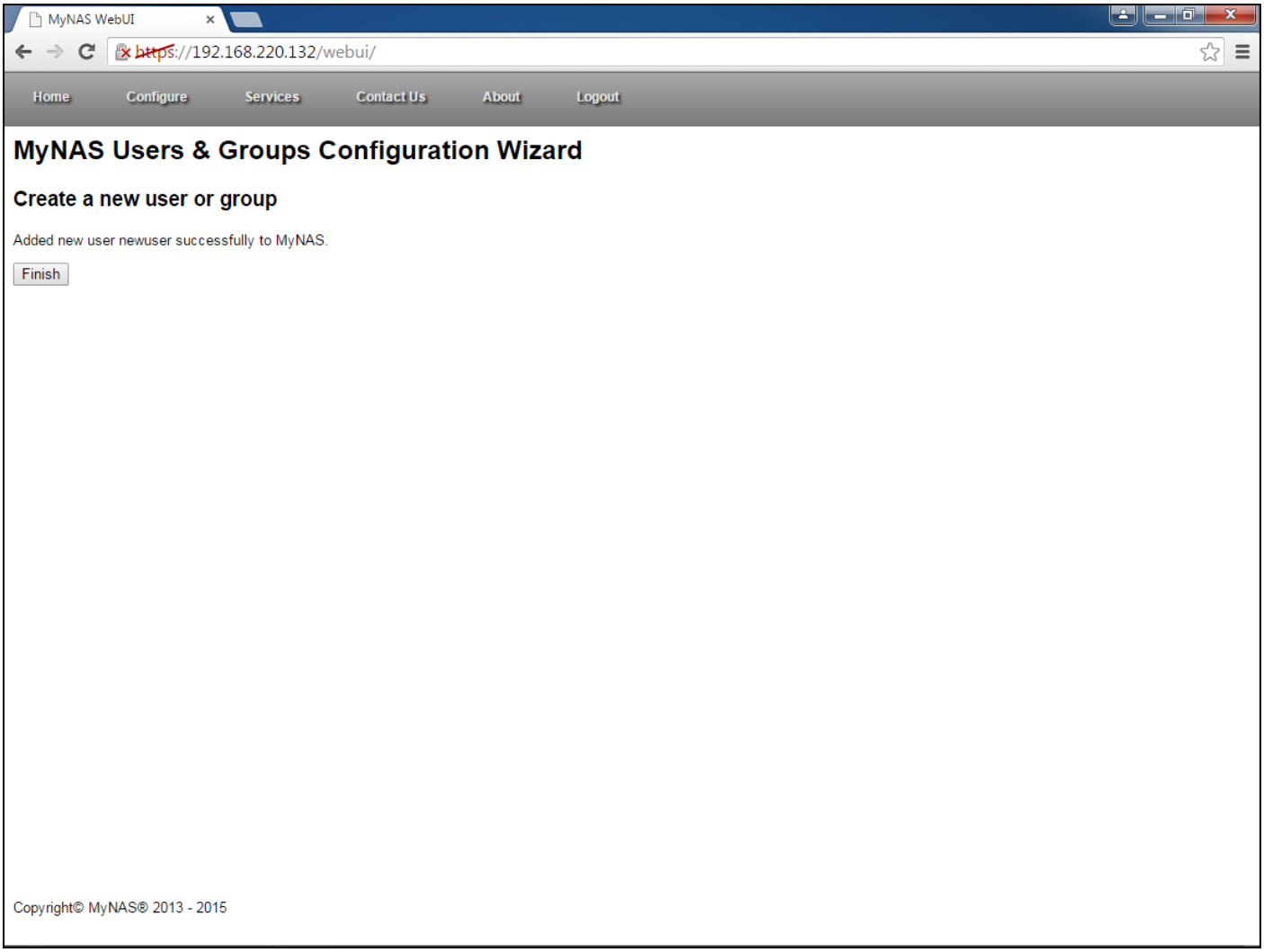
Note: The user password must conform to the following password complexity requirements:

- The password must be longer than 6 characters
- The password must not be based on a dictionary word
- The password cannot contain the username or reverse username
- The password must have at least 2 upper case characters
- The password must have at least 2 number characters
- The password must have at least 2 special characters

Confirm that you want to create the user or group and click 'Confirm'



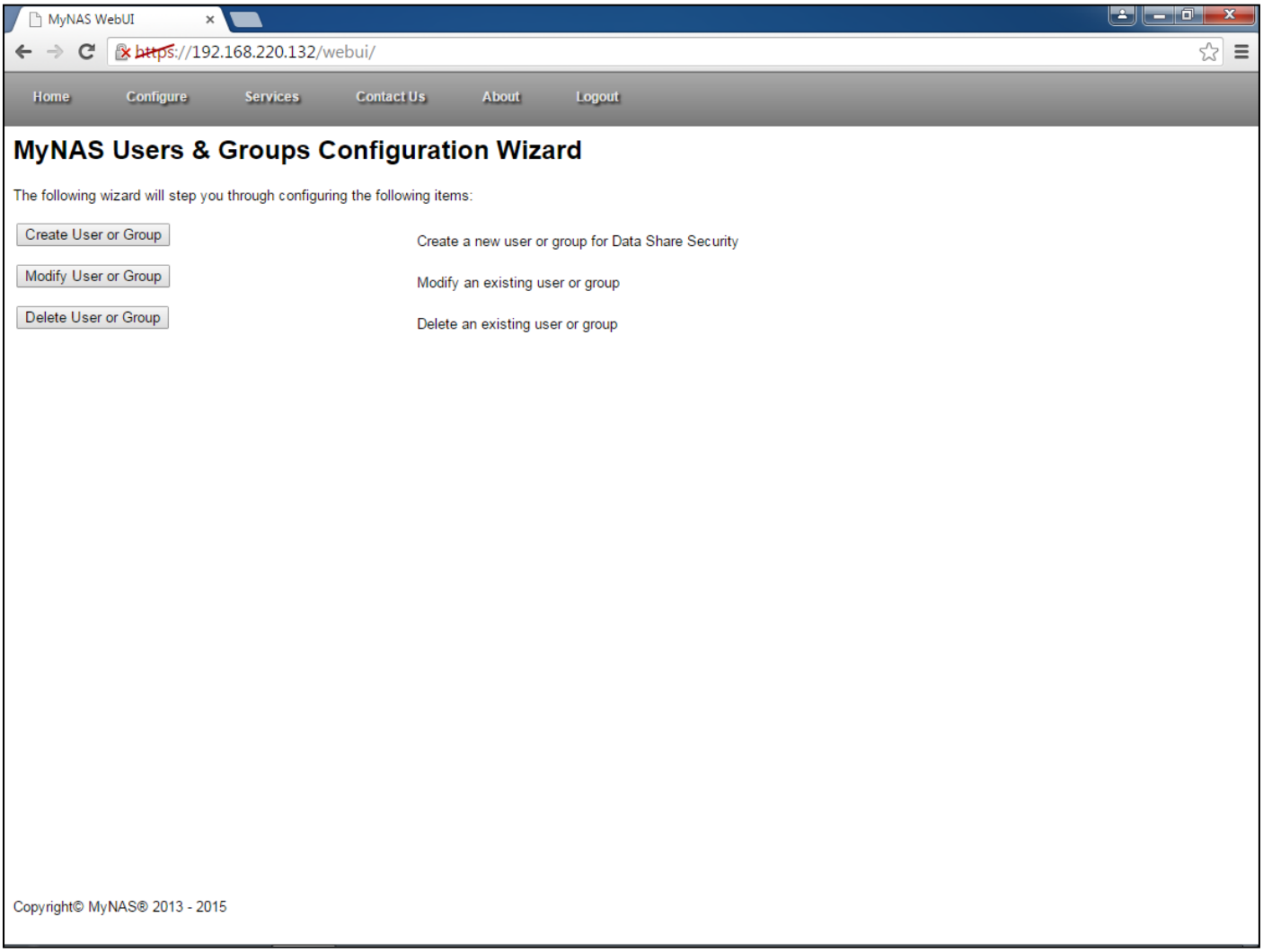
MyNAS will now provision the user as requested.



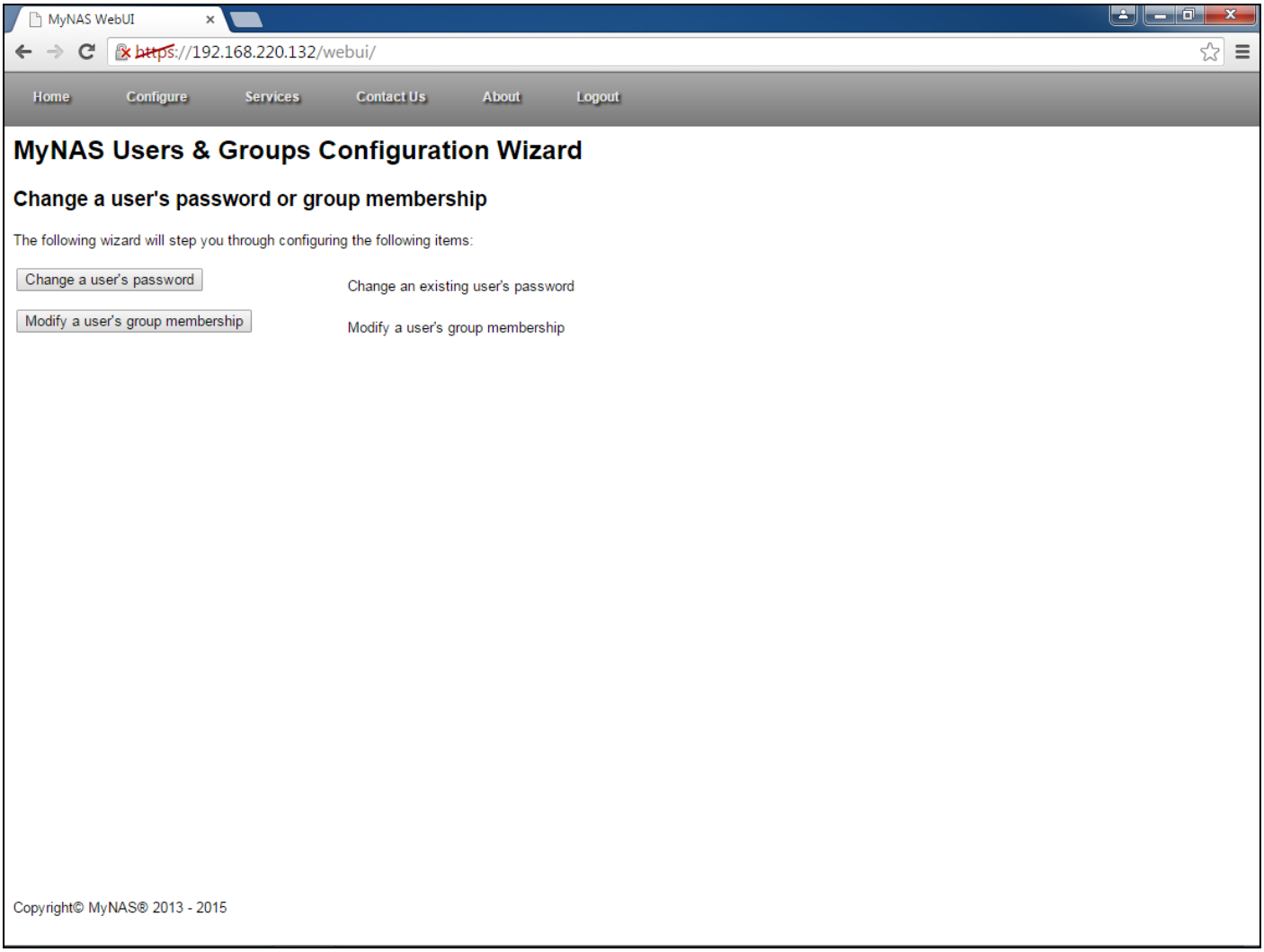
Click 'Finish' to complete the task.

Modifying MyNAS Local Users and Groups

To modify a local users or group, login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Users & Groups'. Once selected, the following will be displayed:



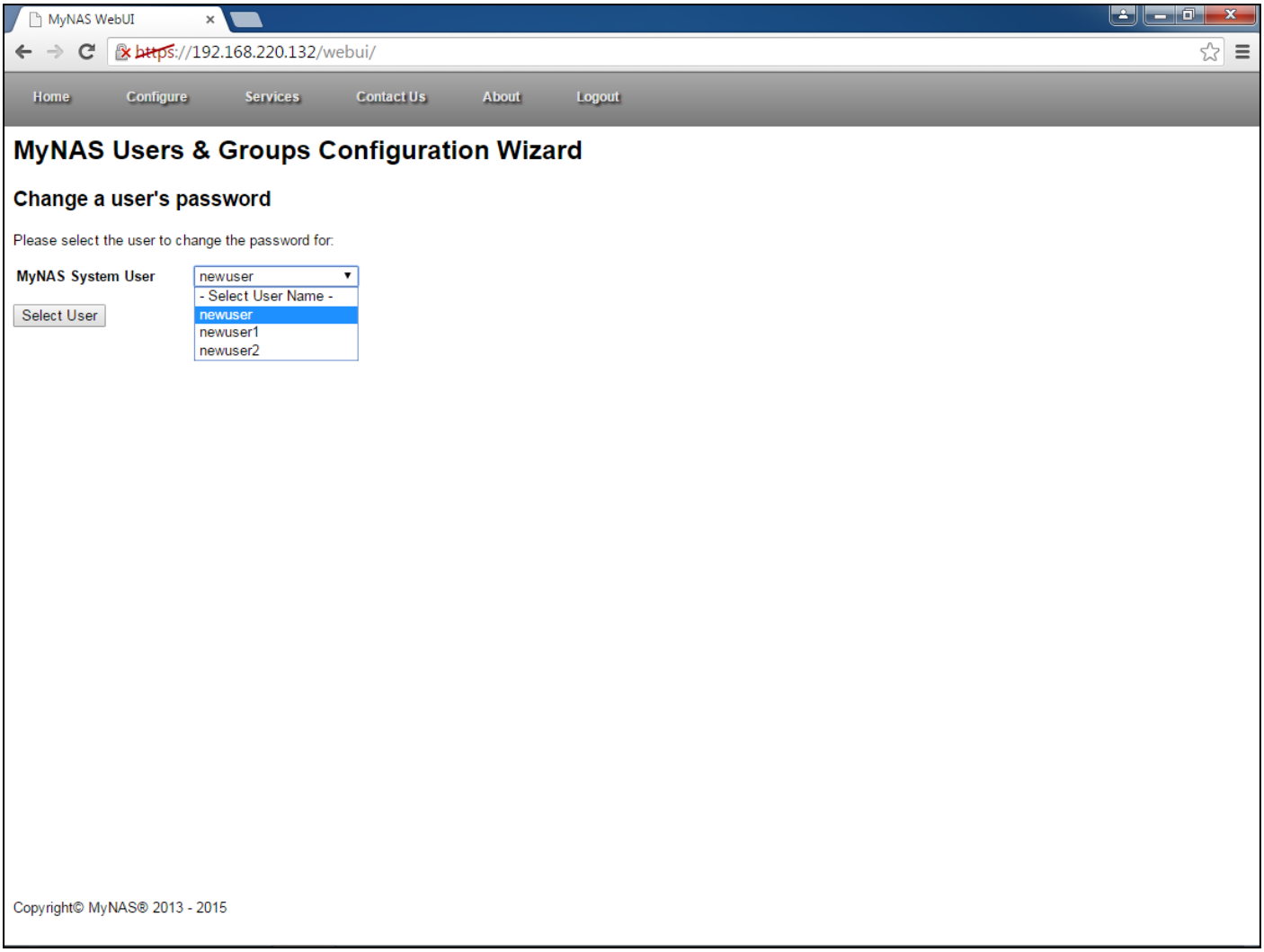
To modify an existing user or group, click the Modify User or Group button, and the following will be displayed:



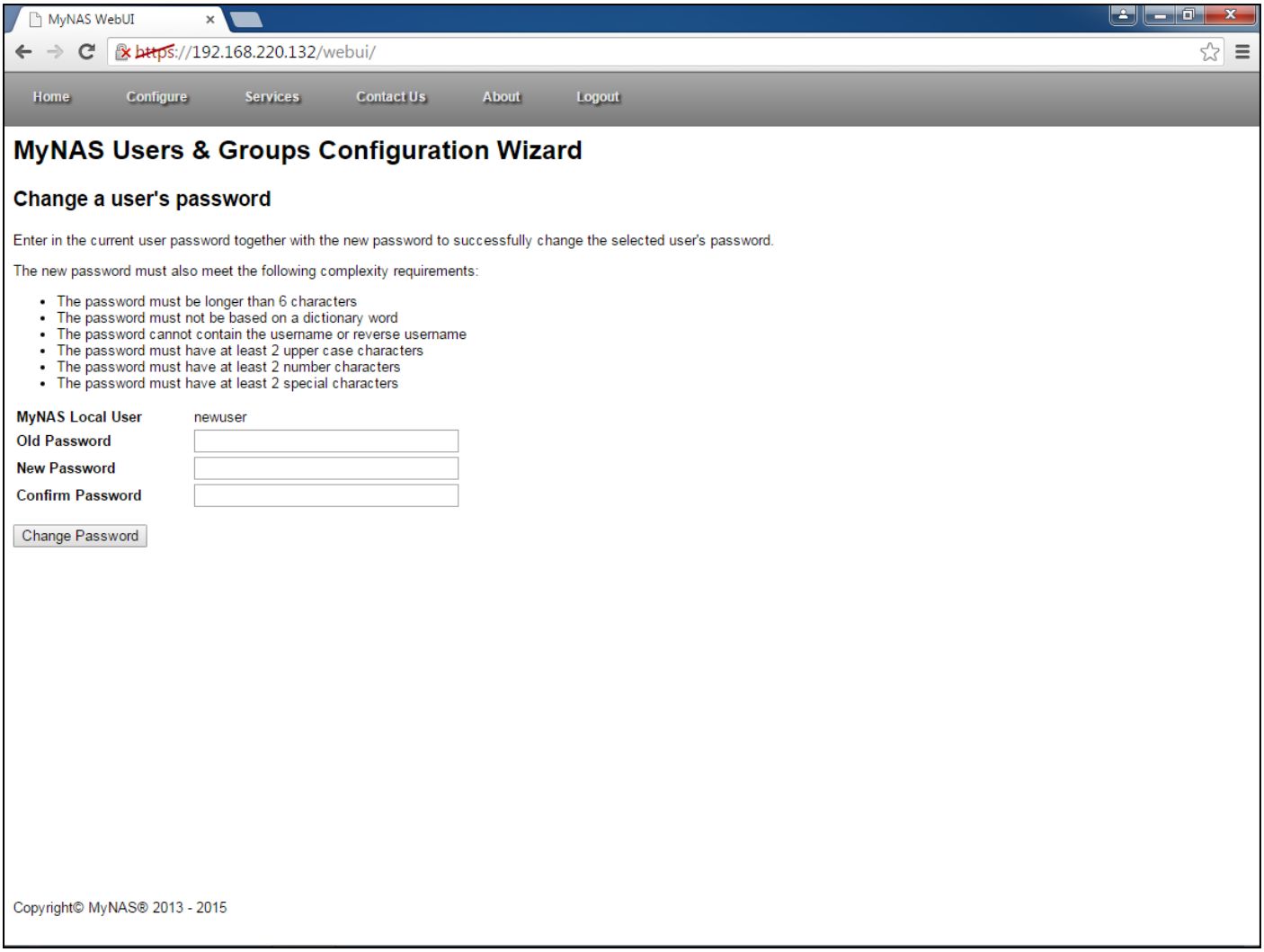
Select the desired modification:

- To change a local user's password, click on the 'Change a user's password' button
- To modify a user's group membership, click on the 'Modify a user's group membership' button

For the purpose of this document, we will modify a user's password.

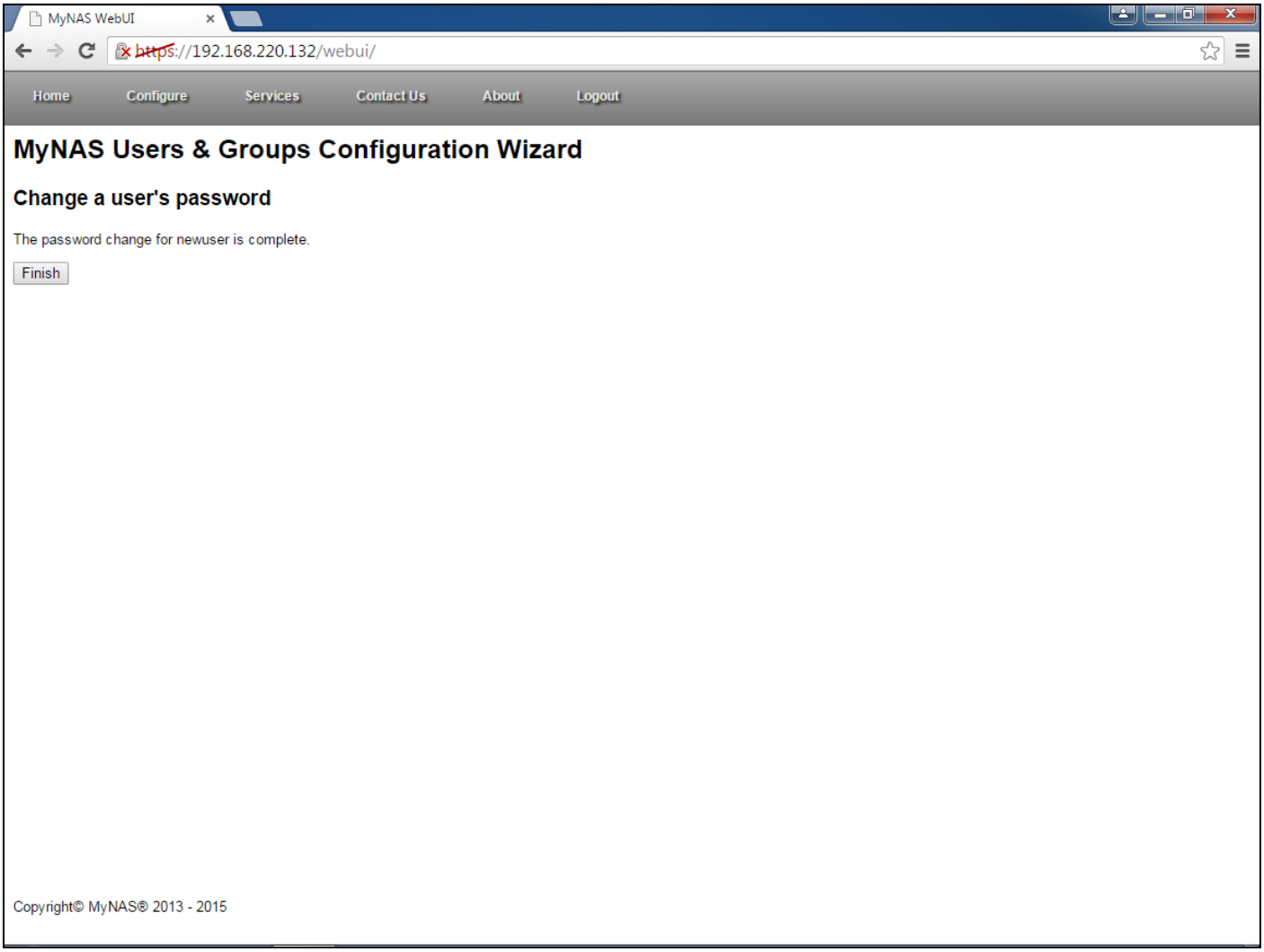


Once the appropriate user is selected, click 'Select User'



Type in the existing users password, together with the new password and its confirmation. Once complete, click the 'Change Password' button.

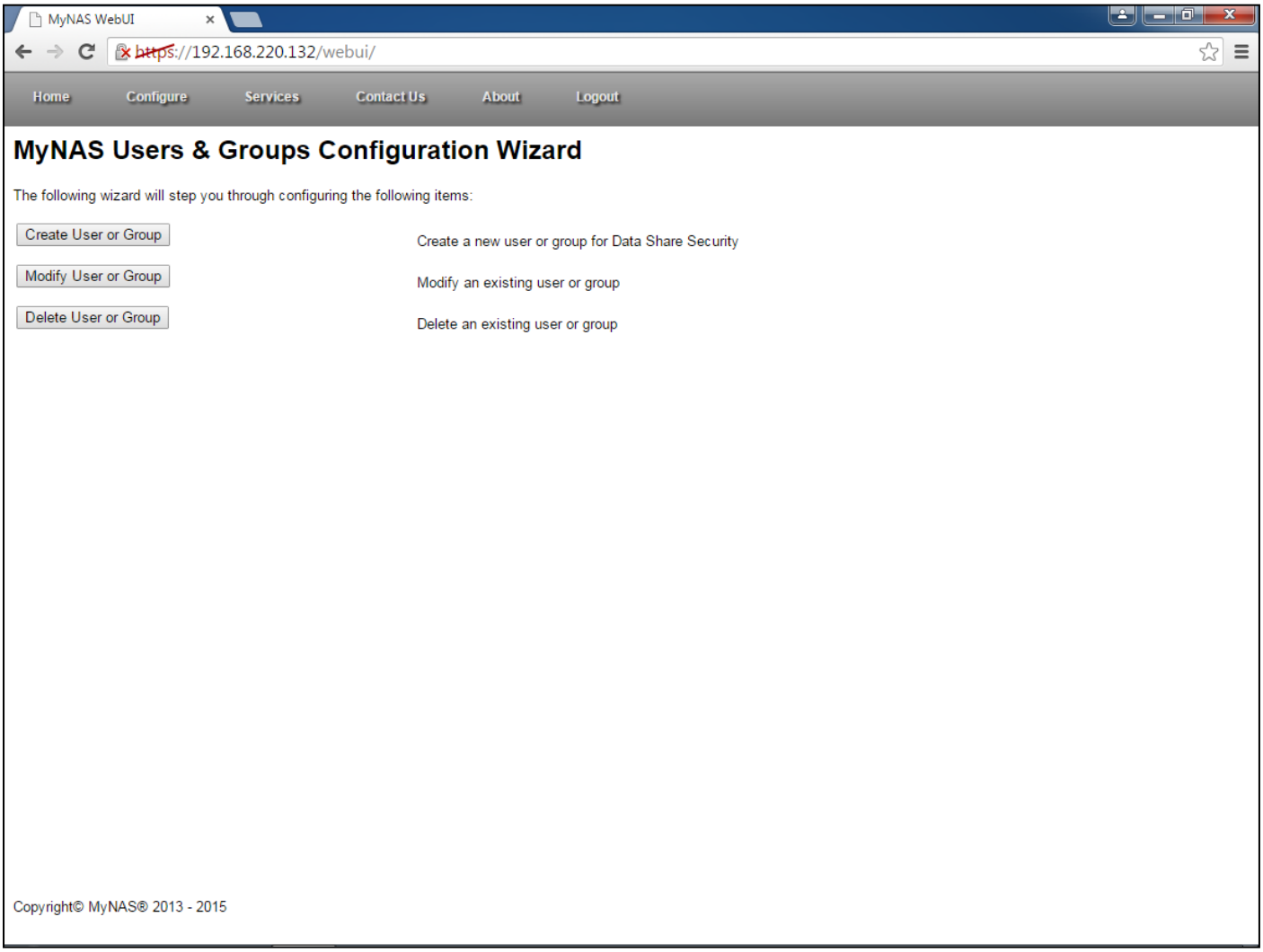
MyNAS will now process the password change.



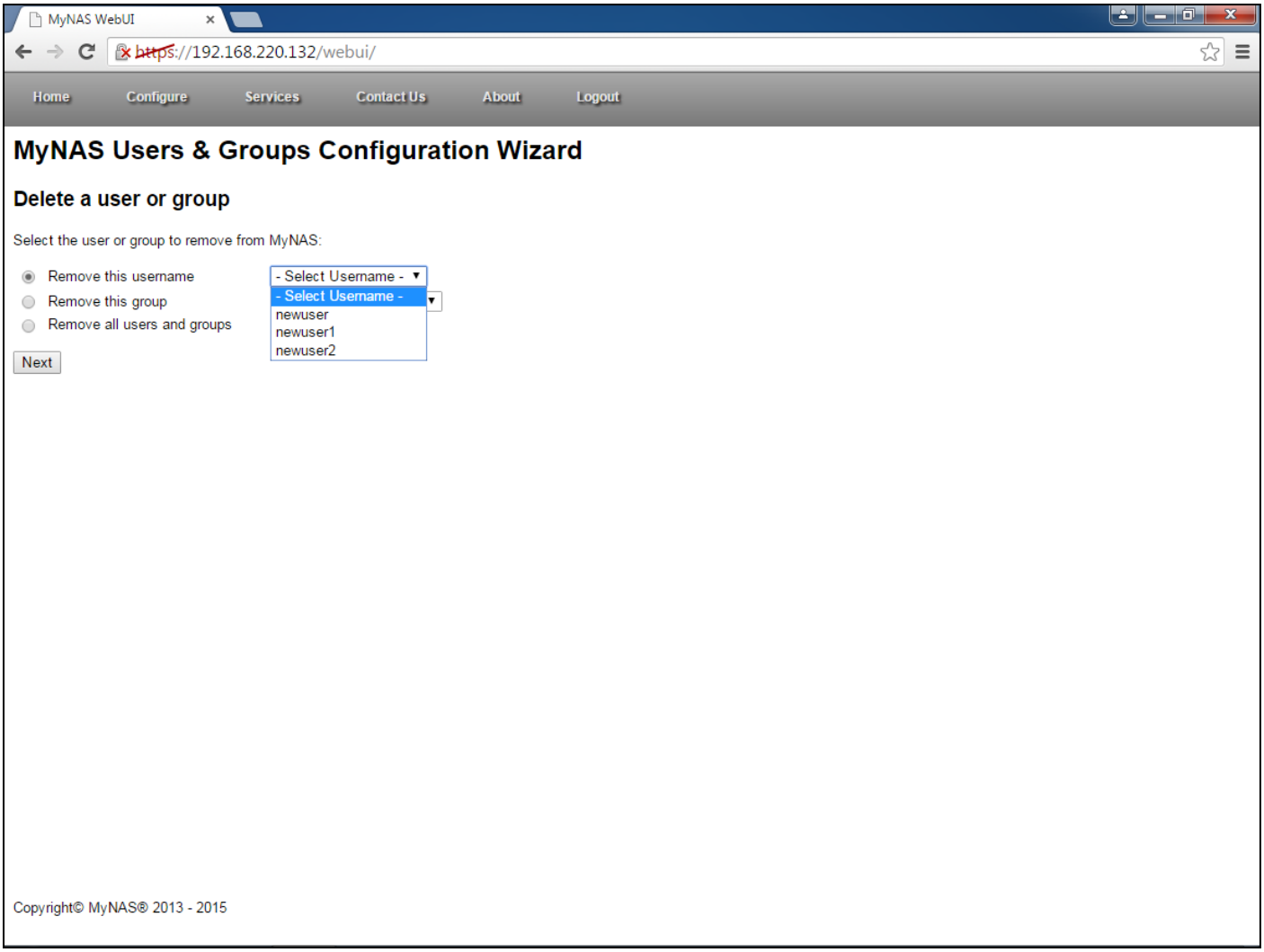
Click 'Finish' to complete the password change process.

Deleting MyNAS Local Users and Groups

To delete a local users or group, login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Users & Groups'. Once selected, the following will be displayed:



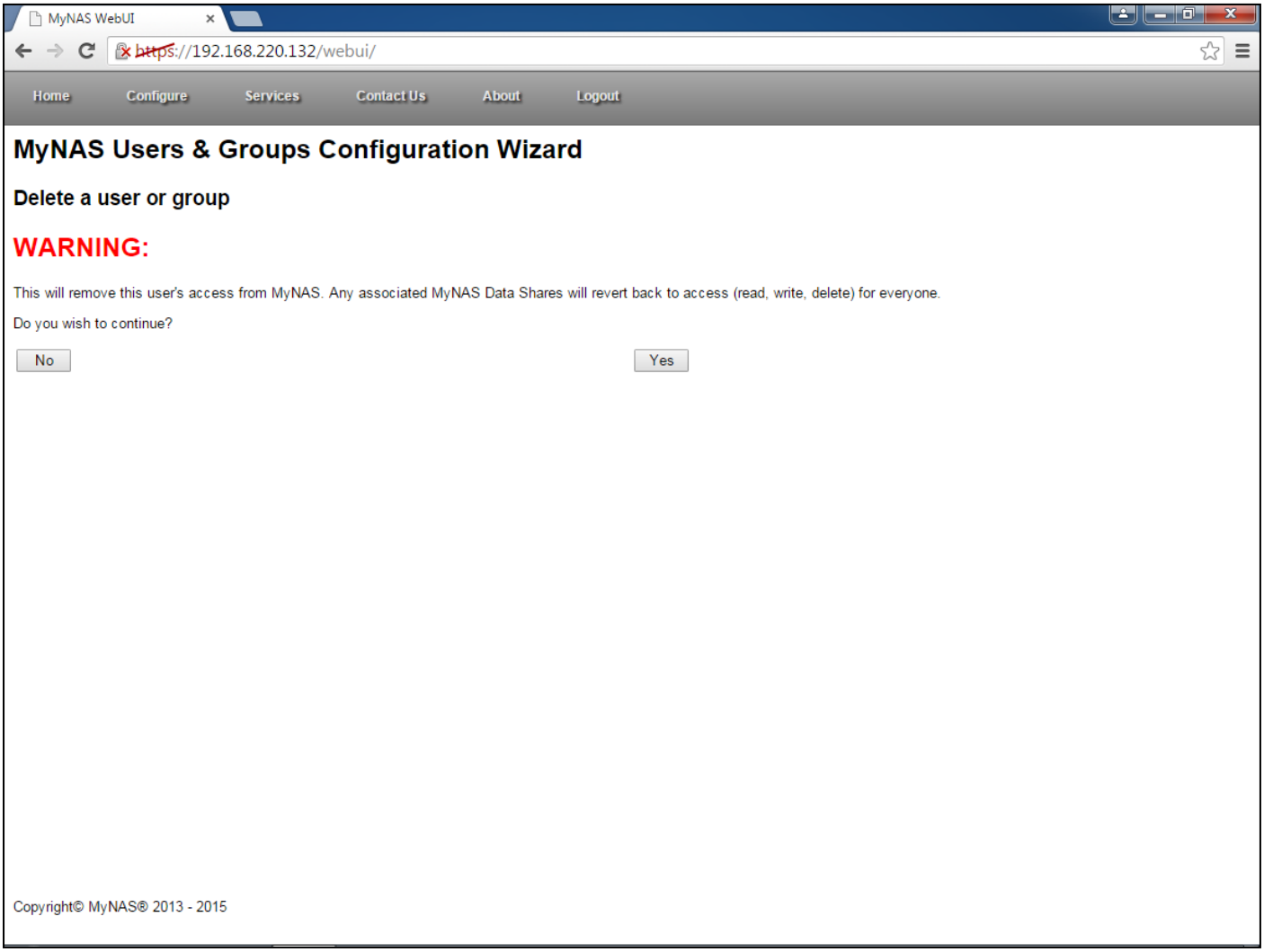
To delete a user or group, click on the 'Delete User or Group' button, and the following will be displayed:



From the drop down, select the appropriate user or group to remove and click 'Next'

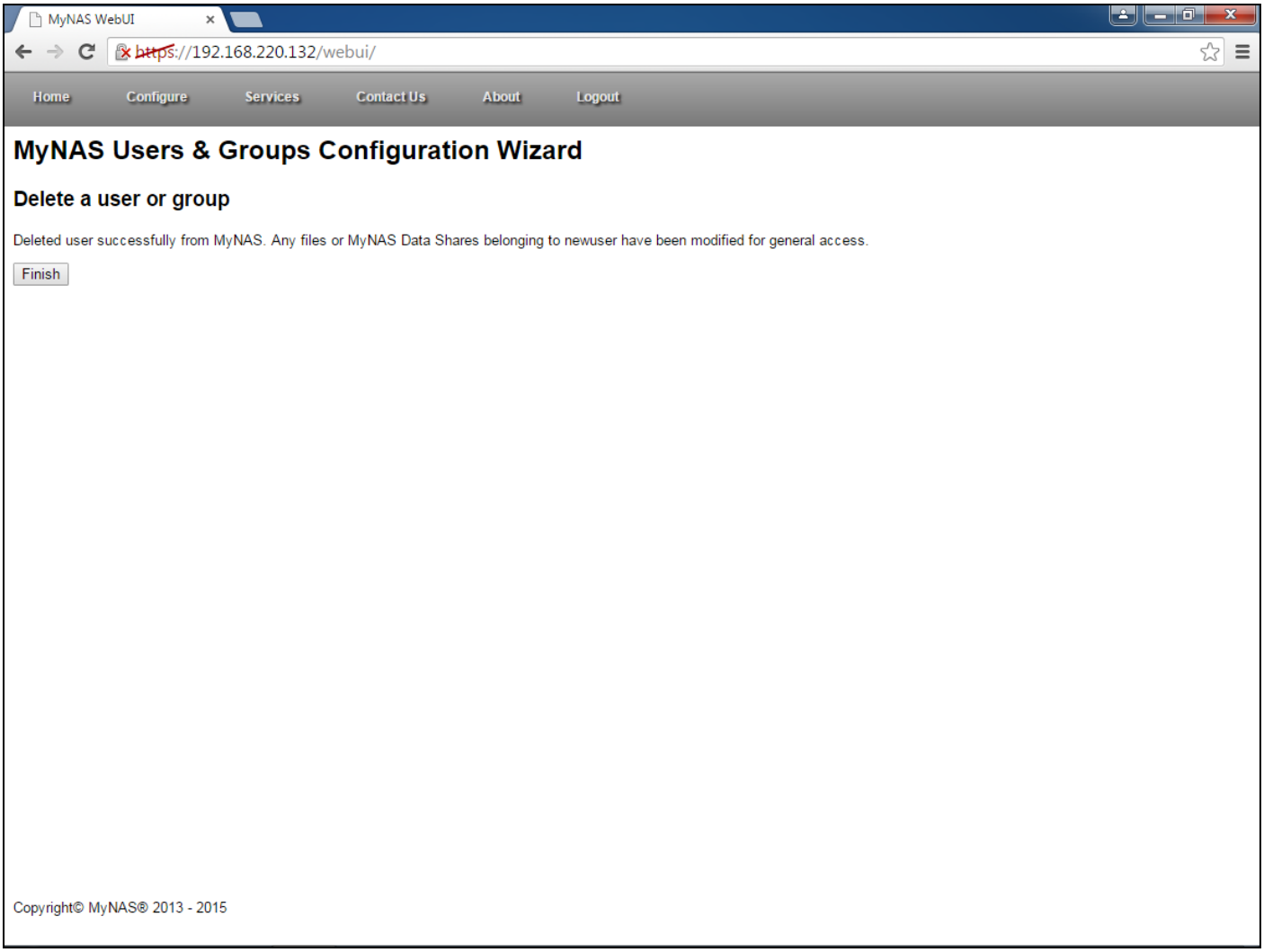
Note: If you want to remove all local users and groups in one action, select the third radio button.

A warning will now be displayed in regards to this action:



If you wish to continue with performing this action, click 'Yes'

The user or group will now be removed as requested



Click 'Finish' to complete with wizard.

Configuring MyNAS Active Directory

By configuring MyNAS to become an Active Directory, this provides the following capabilities

- Authentication for local Data Shares
- Authentication for your whole network environment[3] supporting using home directories, roaming user profiles and group policies

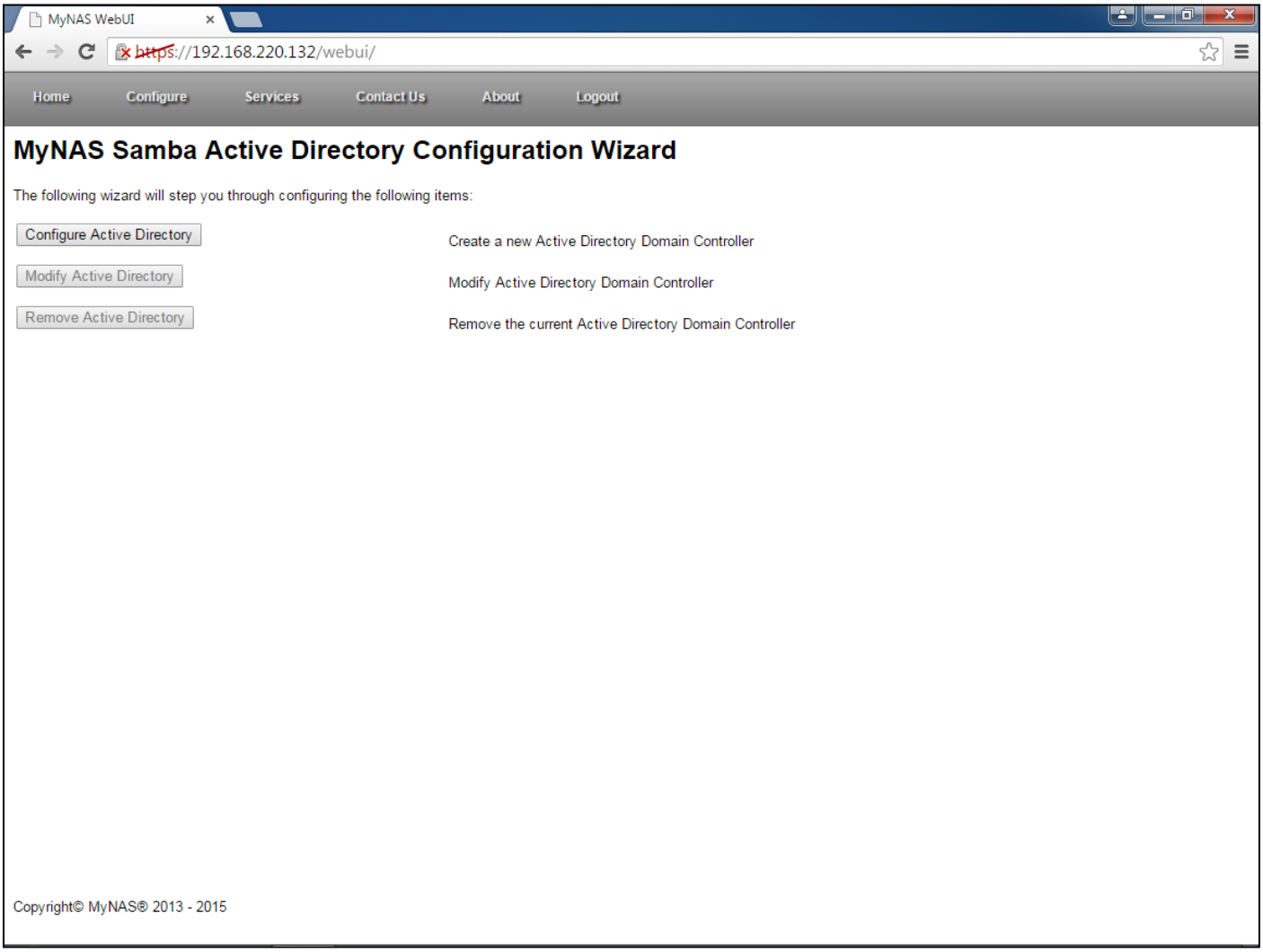
Follow the directions below for configuring Active Directory on MyNAS.

Note: In order to configure Active Directory, a static IP address is required. To configure a static IP address, use the MyNAS Initial Setup Wizard.

Configuring Active Directory

To configure Active Directory, login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Active Directory'.

Once selected, the following will be displayed:

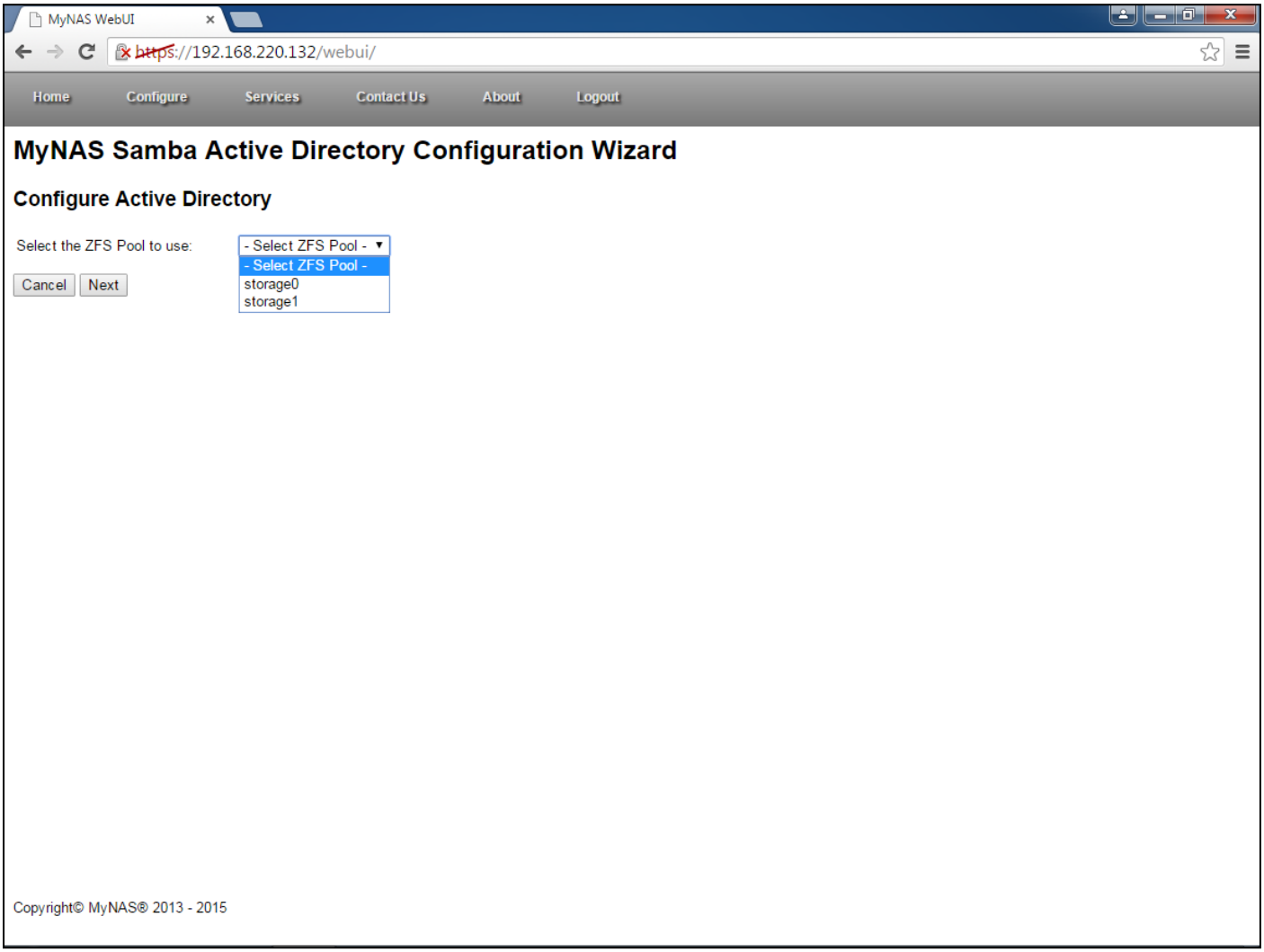


Click on the 'Configure Active Directory' button to begin the configuration wizard.

[3] MyNAS has not been benchmarked for enterprise environments. It has been tested however for supporting small to medium sized deployments.

Depending on the ZFS Pool configuration, if there are more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for Active Directory:

Note: The ZFS Pool will be used for the Active Directory Database and will be used for creating a User Home Directory share.

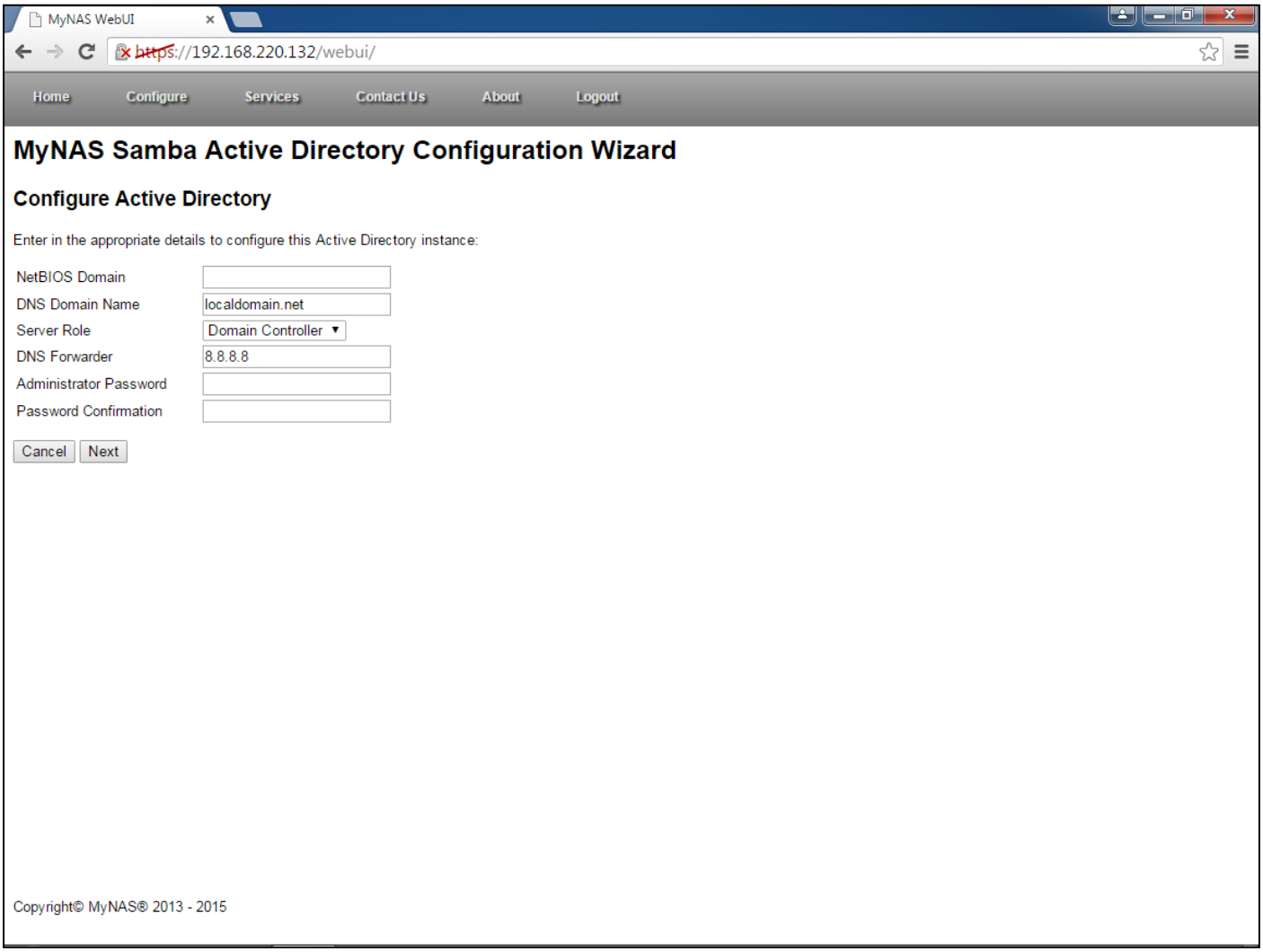


Once the appropriate ZFS pool is selected, click 'Next'

Type in the appropriate details for the configuration of this Active Directory instance.

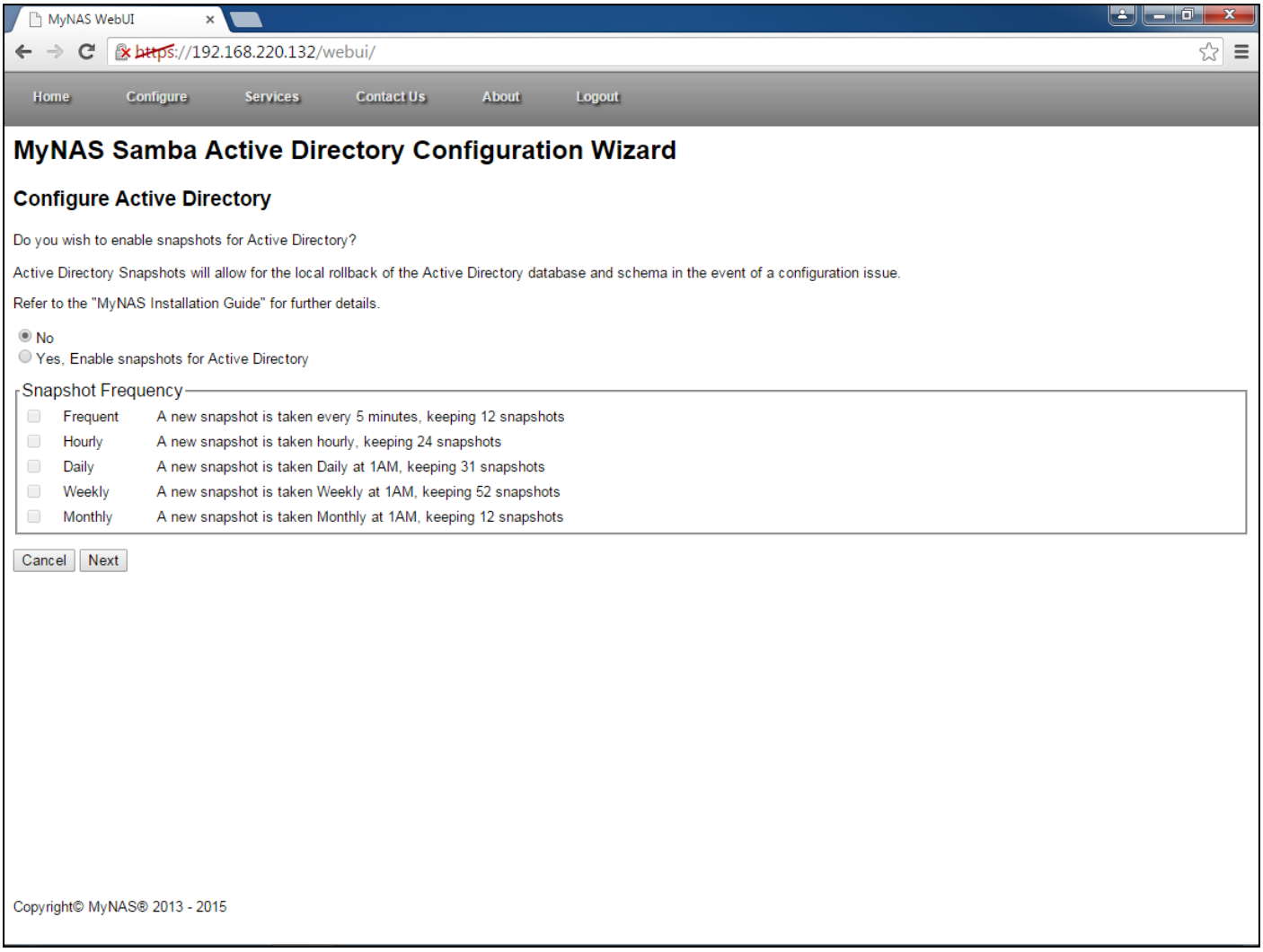
Note: The initial Administrator password must meet Windows password complexity requirements as detailed below:

- Not contain the user's account name or parts of the user's full name that exceed two consecutive characters
- Be at least seven characters in length
- Contain characters from three of the following four categories:
- English uppercase characters (A through Z)
- English lowercase characters (a through z)
- Base 10 digits (0 through 9)
- Non-alphabetic characters (for example, !, $, #, %)



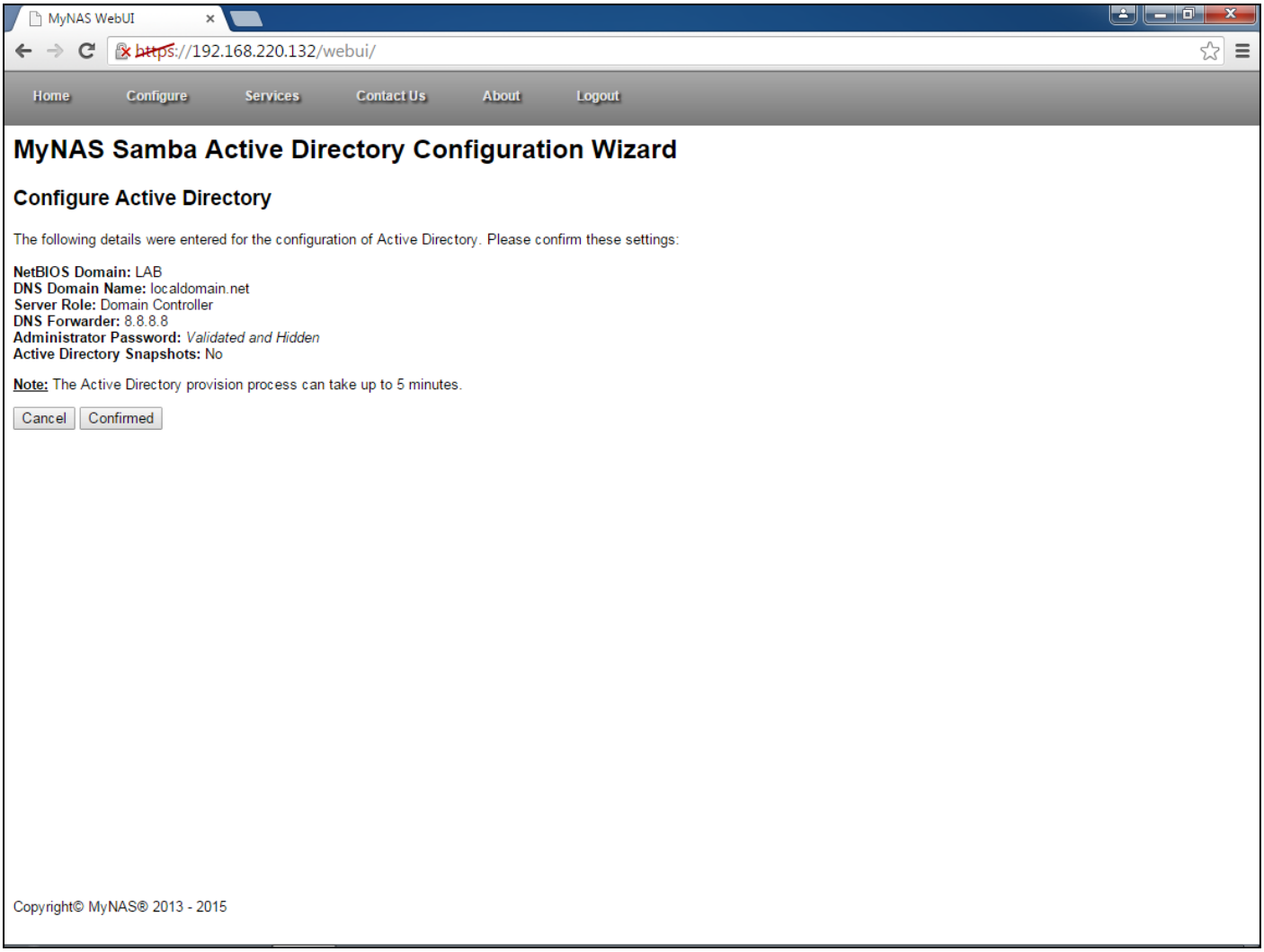
Once configured, click 'Next'.

MyNAS provides the capability to perform snapshots on your Active Directory. This allows the capability to 'roll back' your Active Directory installation to a previous point in time if required.

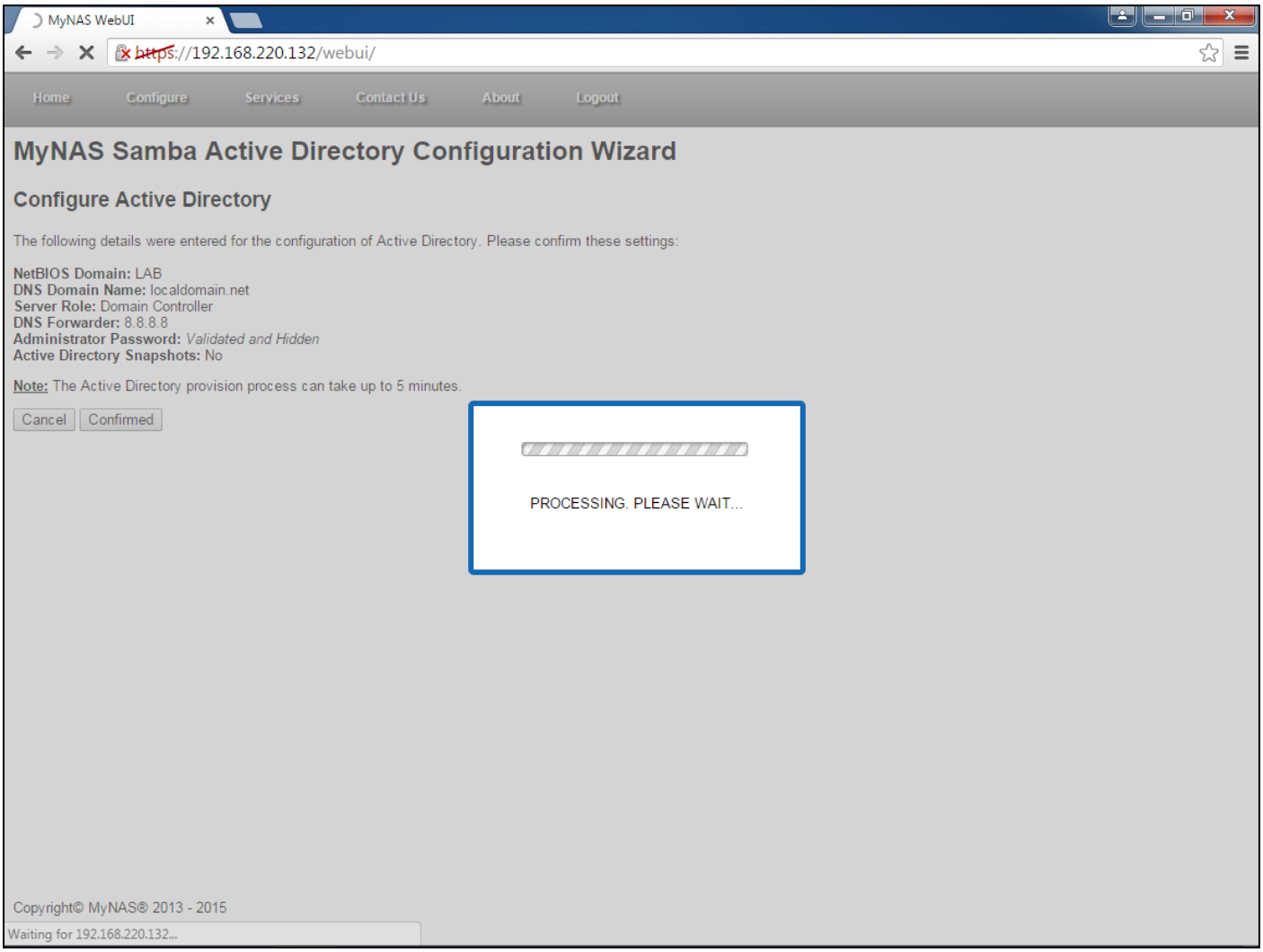


Select the appropriate snapshot configuration for your Active Directory and click 'Next'

Confirm the options selected for the Active Directory installation.

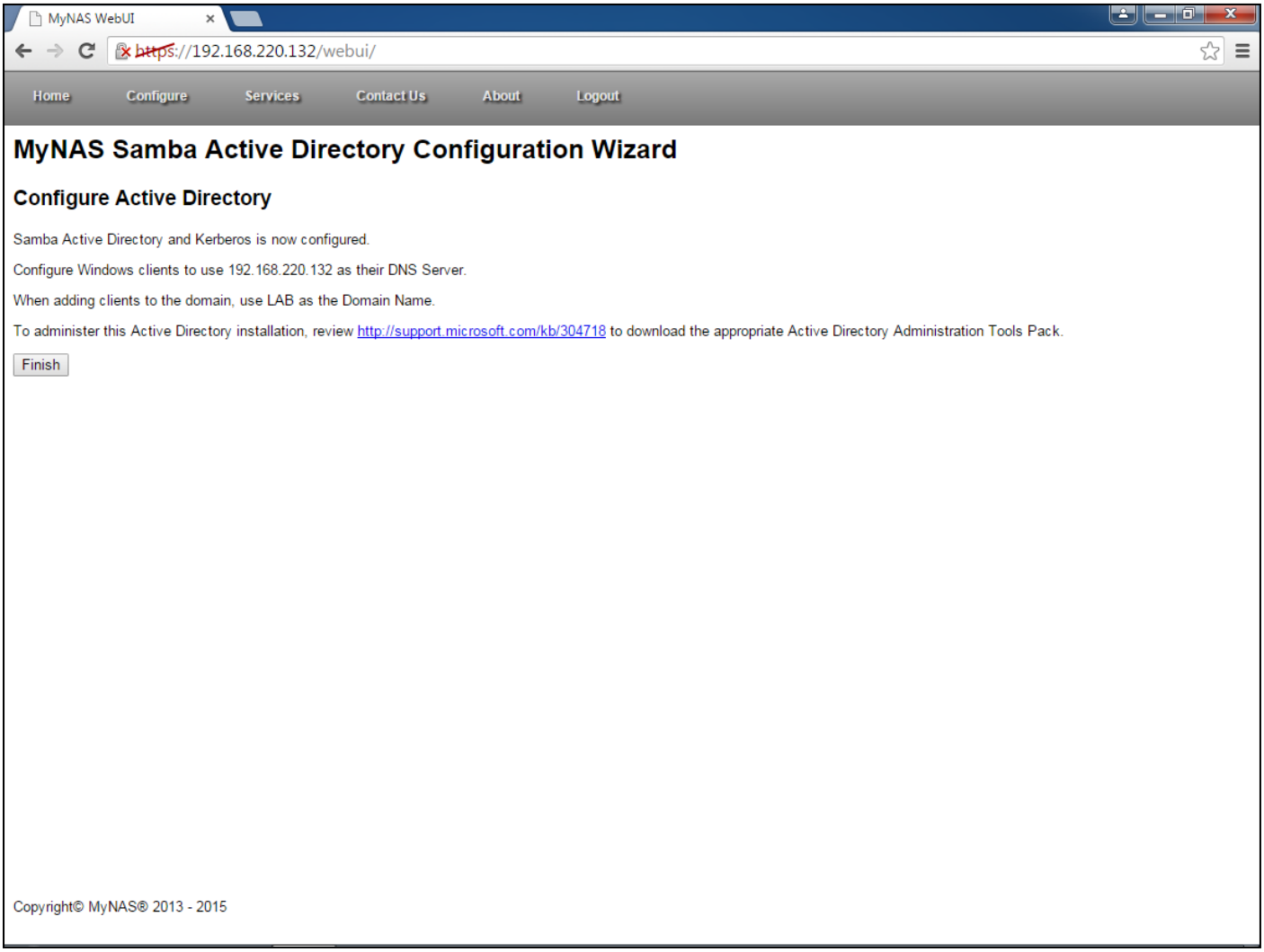


Once confirmed, click 'Confirmed'. MyNAS will now deploy and configure Active Directory on your MyNAS installation.



Note: The Active Directory creation request which can take up to 5 minutes.

Once the configuration task is complete, the following will be displayed.

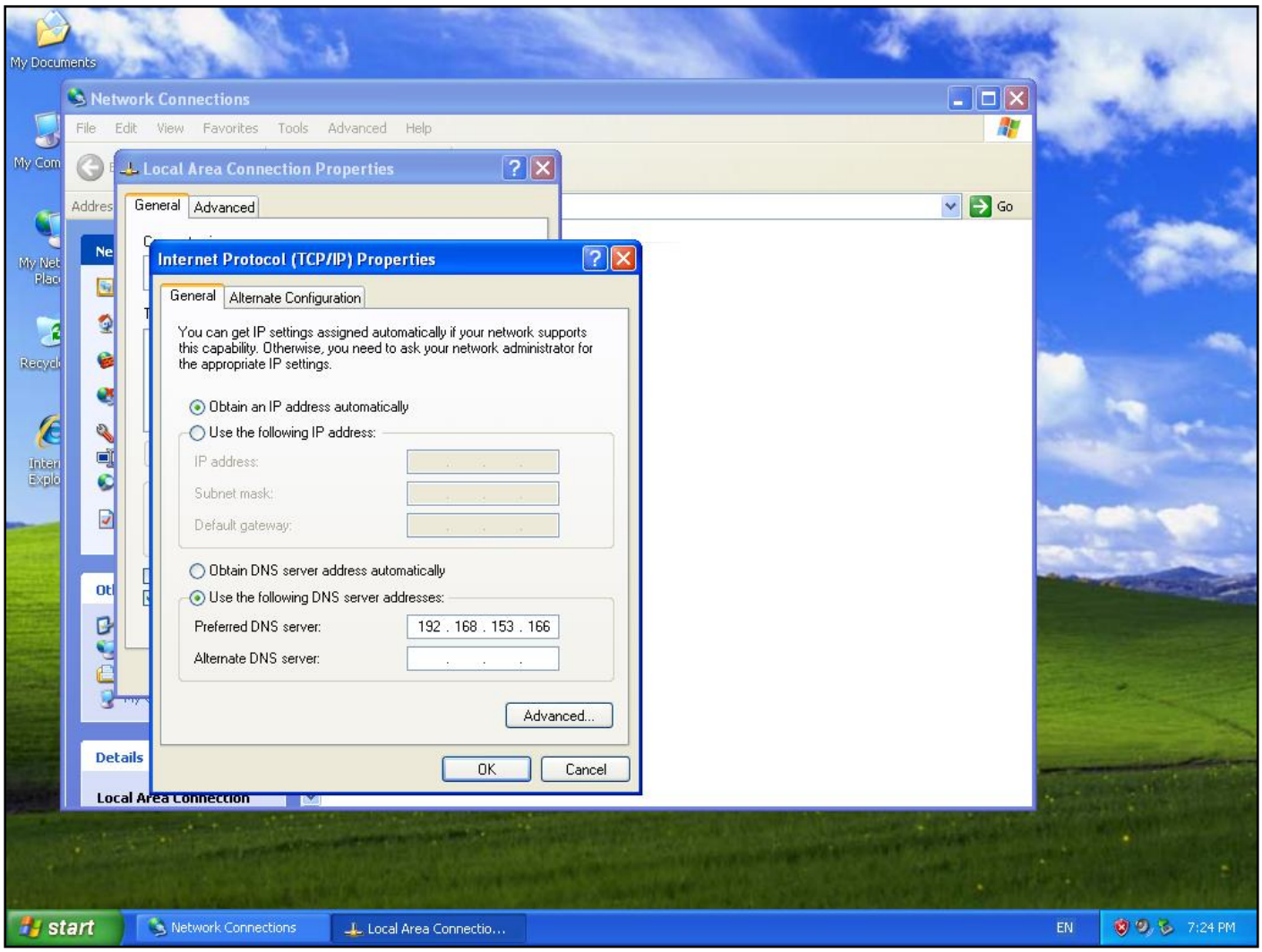


Click 'Finish' to complete the Active Directory wizard.

Joining a Computer to the Active Directory Domain

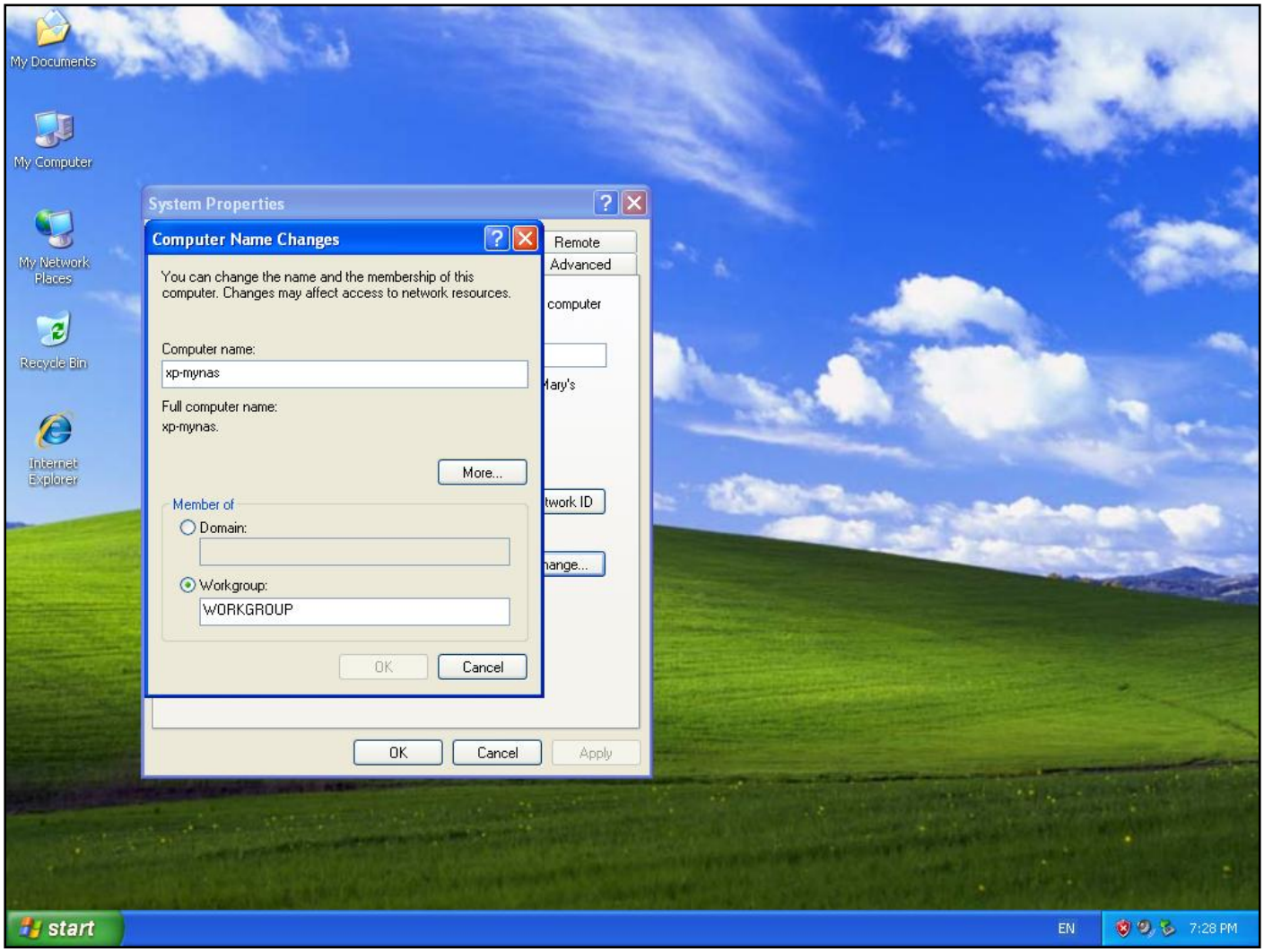
Once Active Directory is configured, additional systems can be configured to join this Active Directory to participate as part of the Domain. Follow the instructions below for adding a Windows system to the Domain.

Configure the Windows system to utilise the IP address of the Active Directory server as the DNS Server:

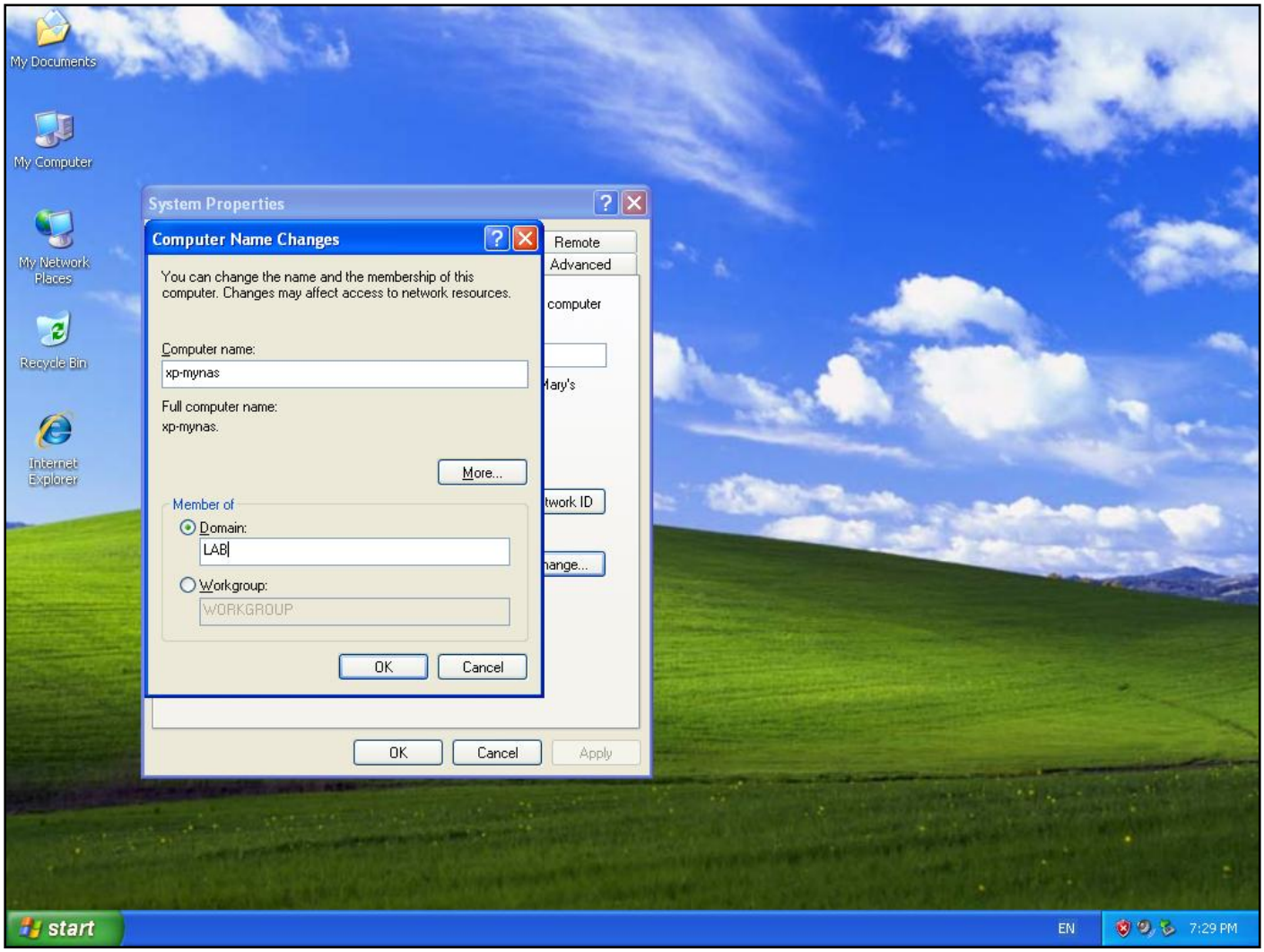


Click on OK to save the settings.

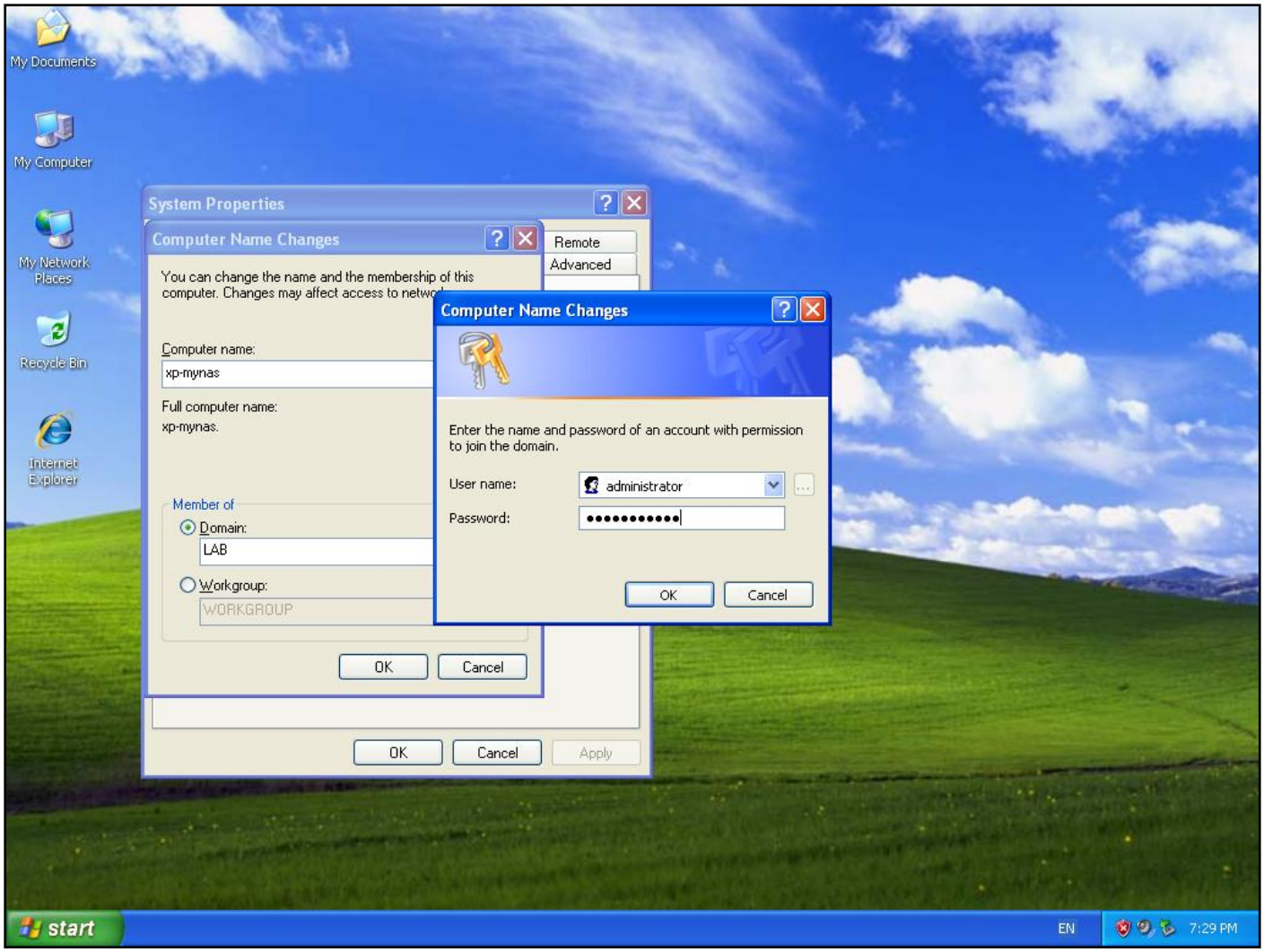
Next, bring up the system properties, and click the 'Change' button



Change the radio button from 'Workgroup' to 'Domain', typing in the NetBIOS domain used when configuring Active Directory

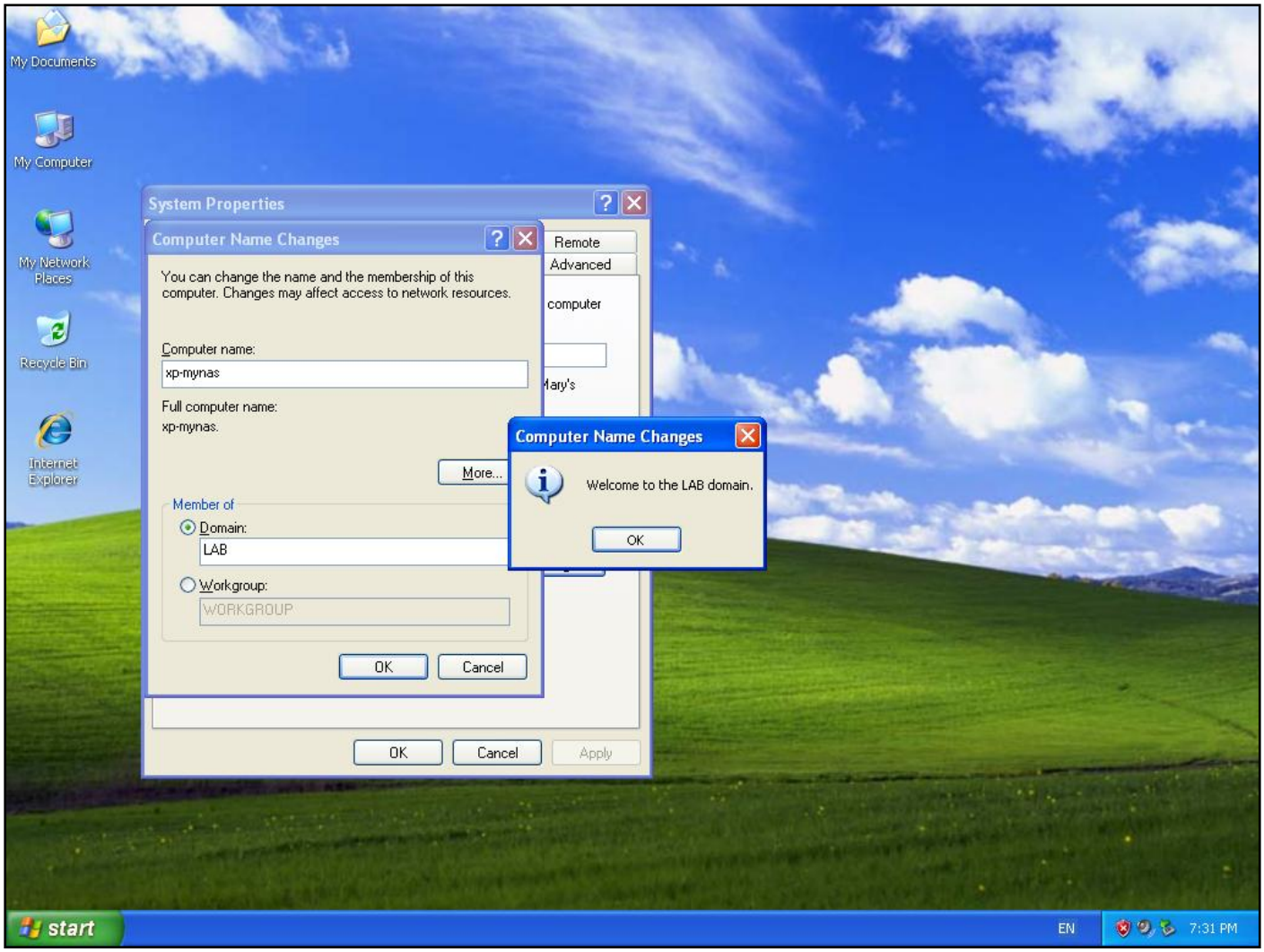


Click OK and type in the Administrator username and the password set during the Active Directory installation

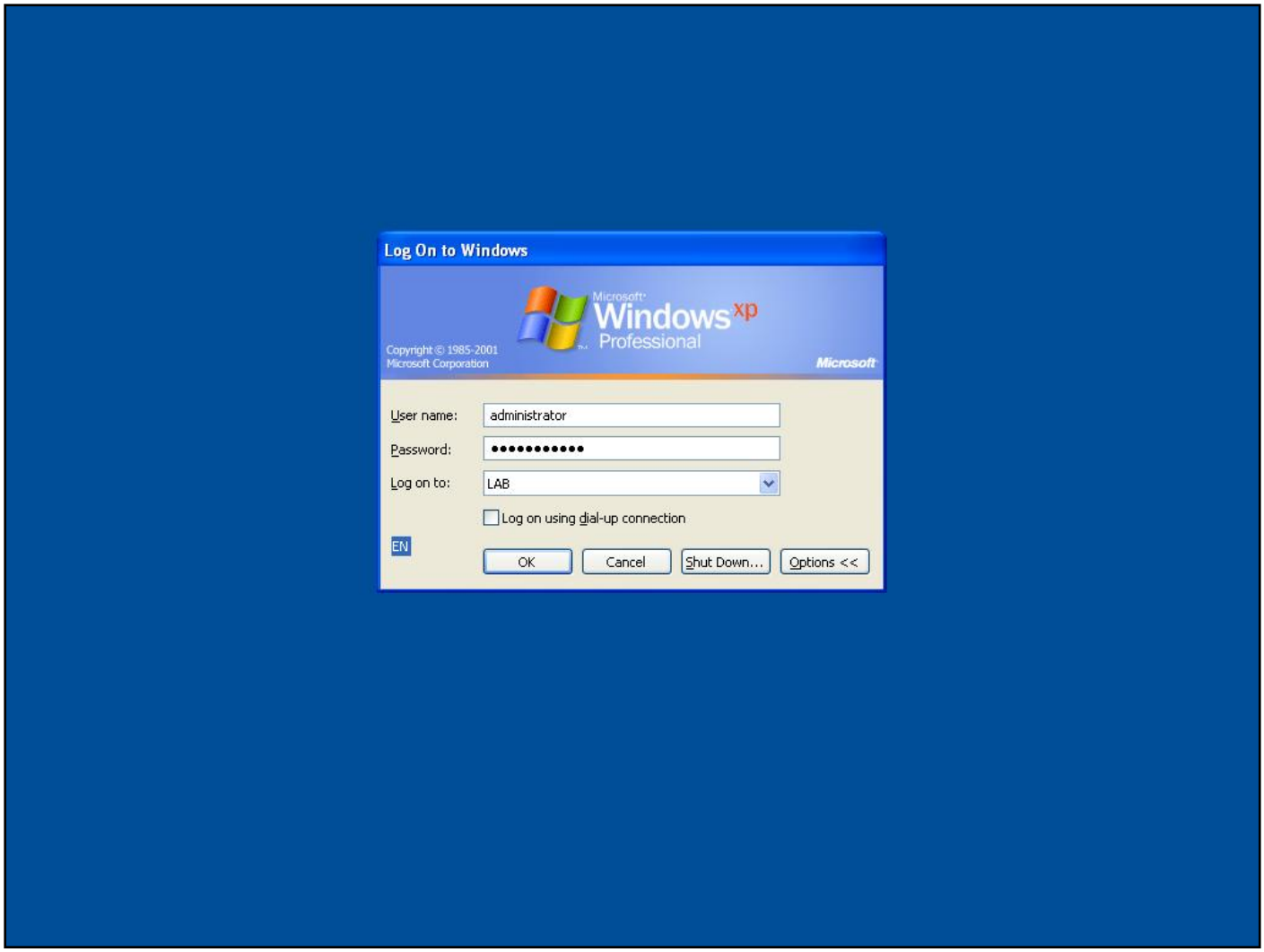


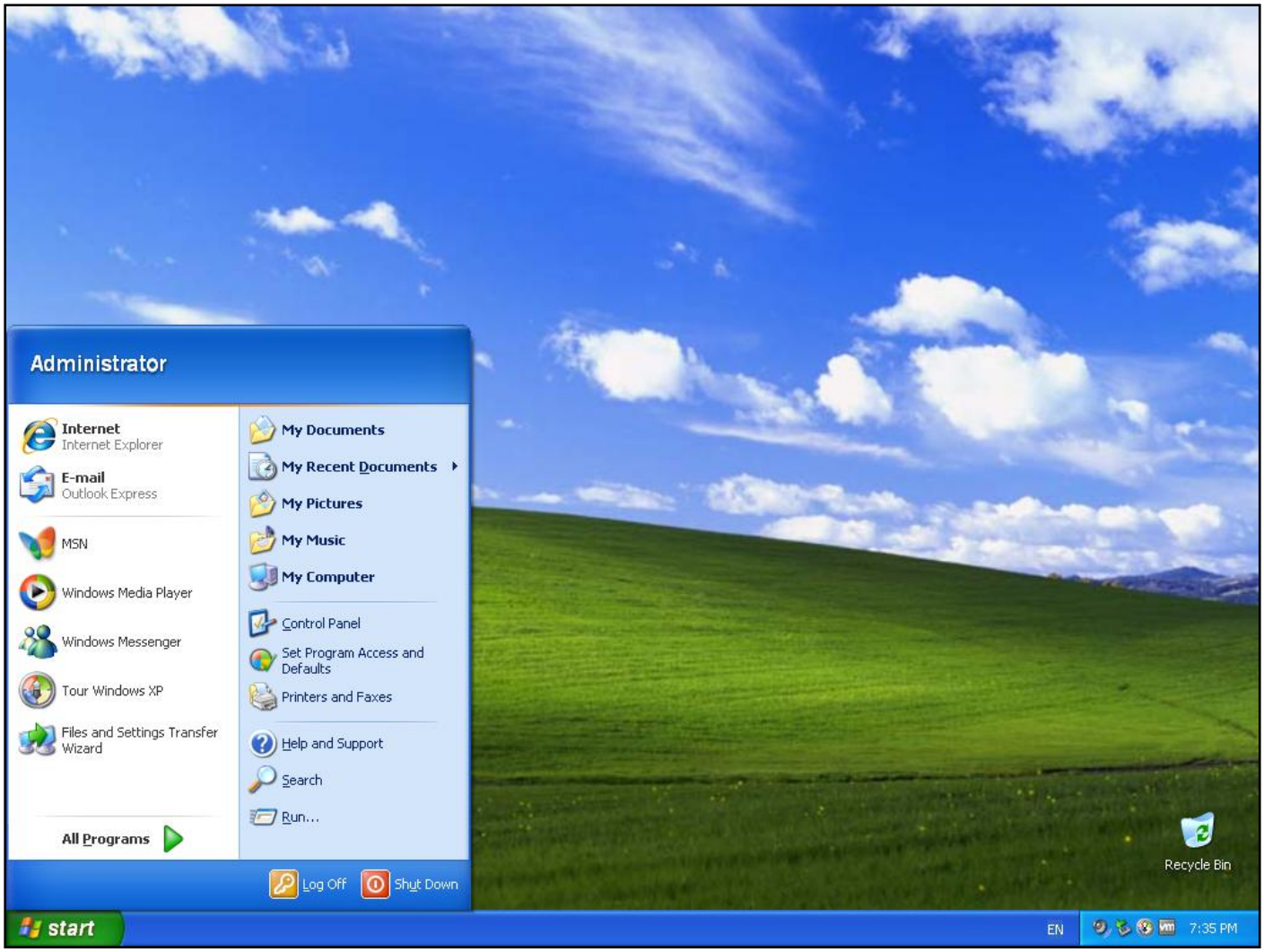
Click 'OK' and Windows will process the configuration of adding this system to Active Directory running on MyNAS.

Once complete, a confirmation is presented and the Windows system will need to be rebooted



After the reboot, you will be able to select the Domain and login as a domain user


Log On to Windows
Microsoft Windows xp Professional
Copyright © 1985-2001
Microsoft Corporation
Microsoft
User name:
administrator
Password:
Log on to:
LAB
Log on using dial-up connection
EN
OK
Cancel
Shut Down...
Options <<



Managing Users, Groups, Group Policies

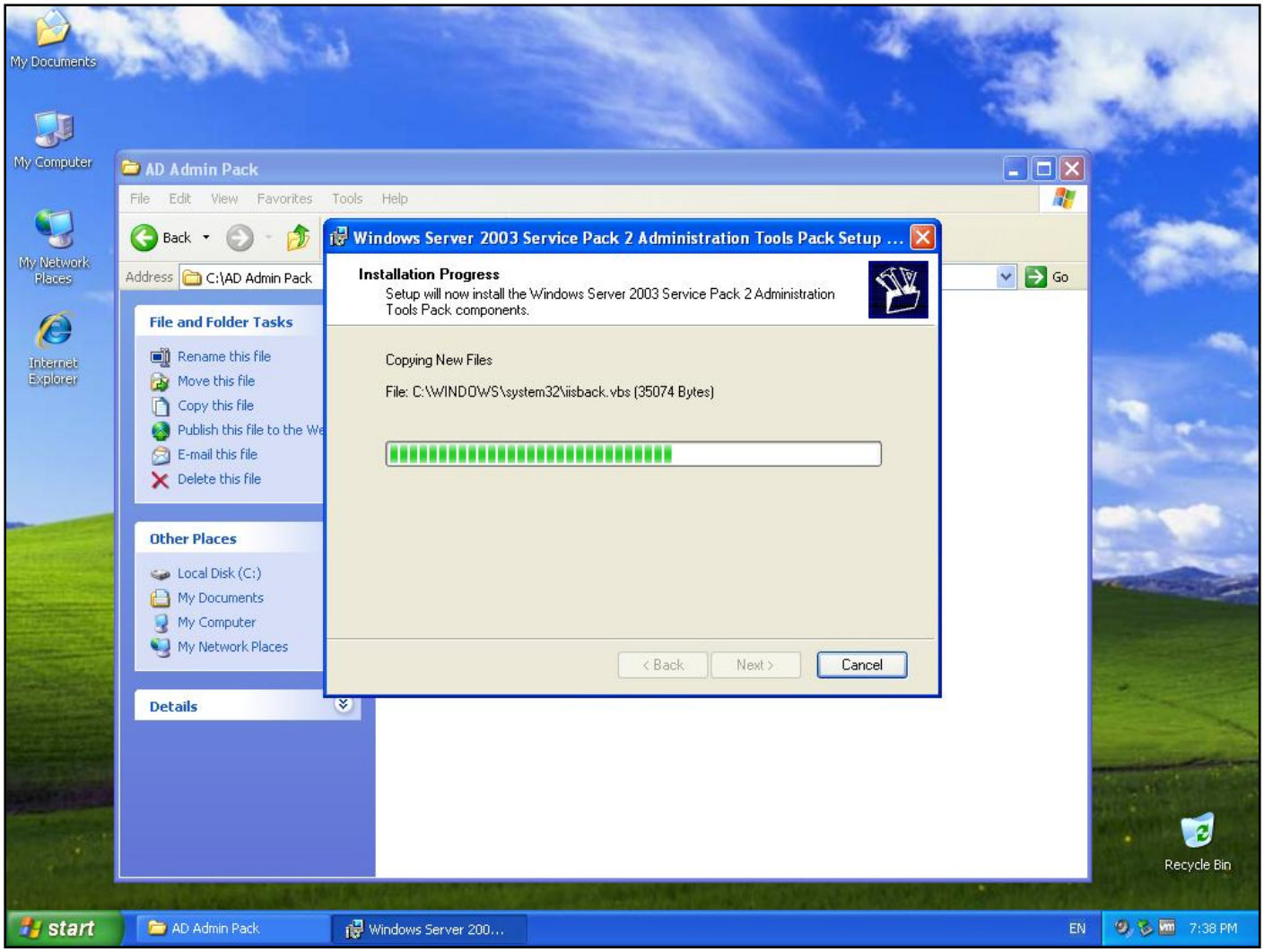
MyNAS does not provide the capability to manage the Active Directory instance directly through the WebUI. Specific tools from Microsoft are required to manage the Active Directory Domain when not using a Windows Server.

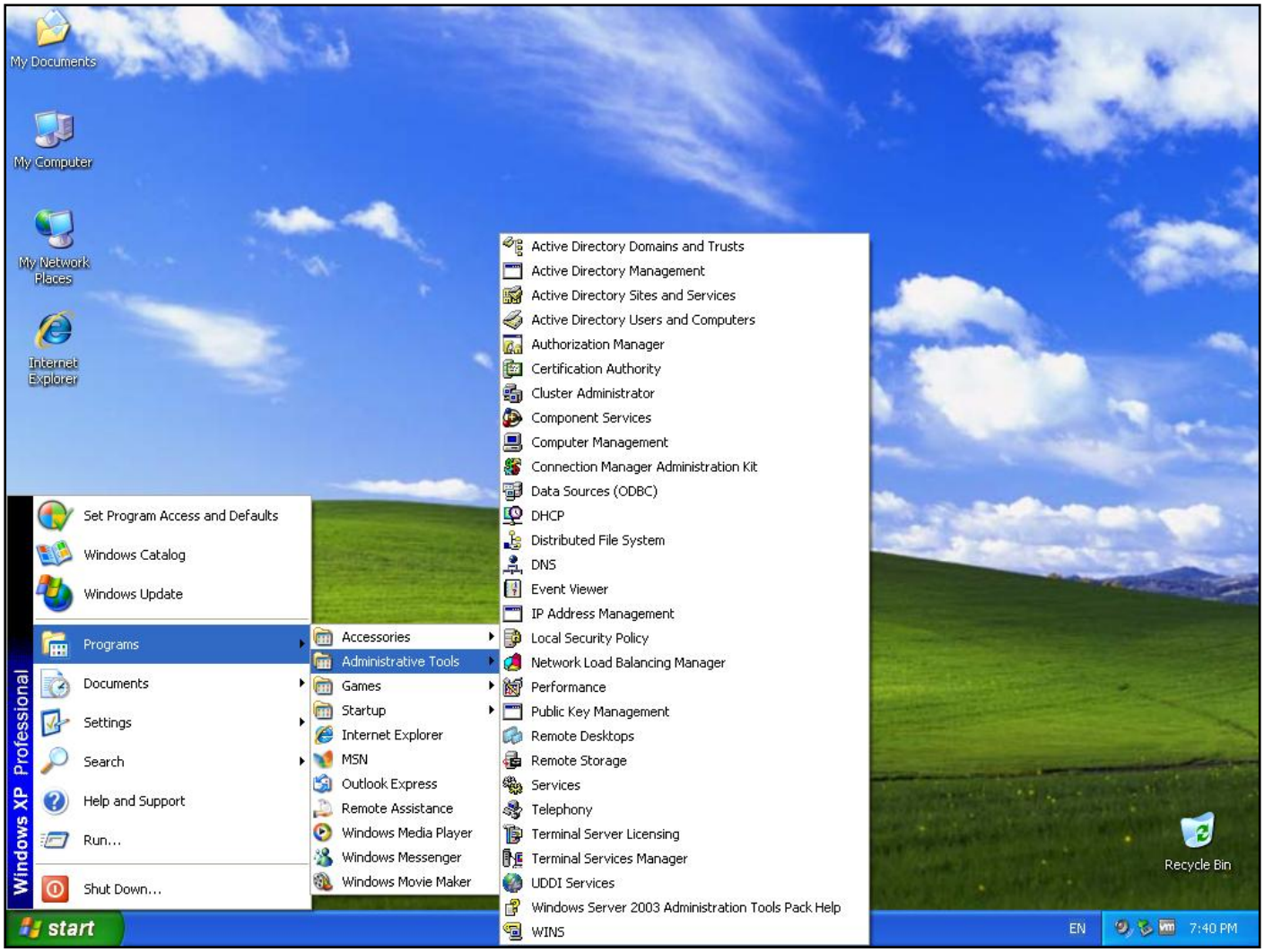
For Windows XP, 2003 this tool can be downloaded from http://www.microsoft.com/en-au/download/details.aspx?id=6315

For Windows 7, Windows 8, Windows 2008 this tool can be downloaded from http://www.microsoft.com/en-us/download/details.aspx?id=7887

For further details regarding the Microsoft Active Directory Administration Tools, refer to http://support.microsoft.com/kb/304718

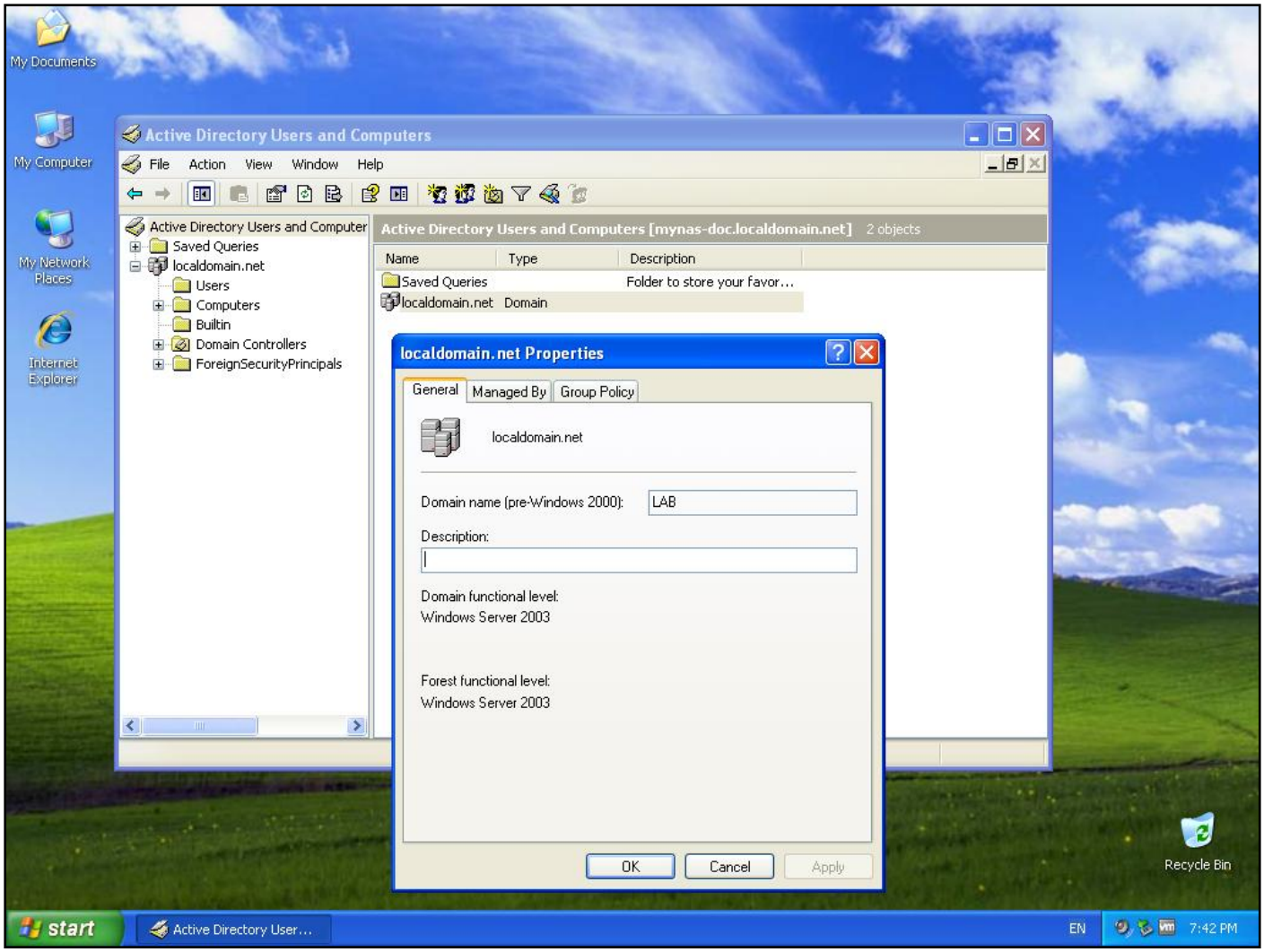
Once the appropriate tool has been identified, download and install the Administration Tools onto a system that is now joined to the domain.


My Documents
My Computer
My Network Places
Internet Explorer
AD Admin Pack
File Edit View Favorites Tools Help
Back
Address C:\AD Admin Pack
Go
File and Folder Tasks
Rename this file
Move this file
Copy this file
Publish this file to the We
E-mail this file
Delete this file
Other Places
Local Disk (C:)
My Documents
My Computer
My Network Places
Details
Windows Server 2003 Service Pack 2 Administration Tools Pack Setup ...
Installation Progress
Setup will now install the Windows Server 2003 Service Pack 2 Administration Tools Pack components.
Copying New Files
File: C:\WINDOWS\system32\iisback.vbs (35074 Bytes)
< Back
Next >
Cancel
Recycle Bin
start
AD Admin Pack
Windows Server 200...
EN
7:38 PM



Once the tools have been installed the following tools can be used to administer the Active Directory instance on MyNAS:

- Active Directory Users and Computers
- DNS

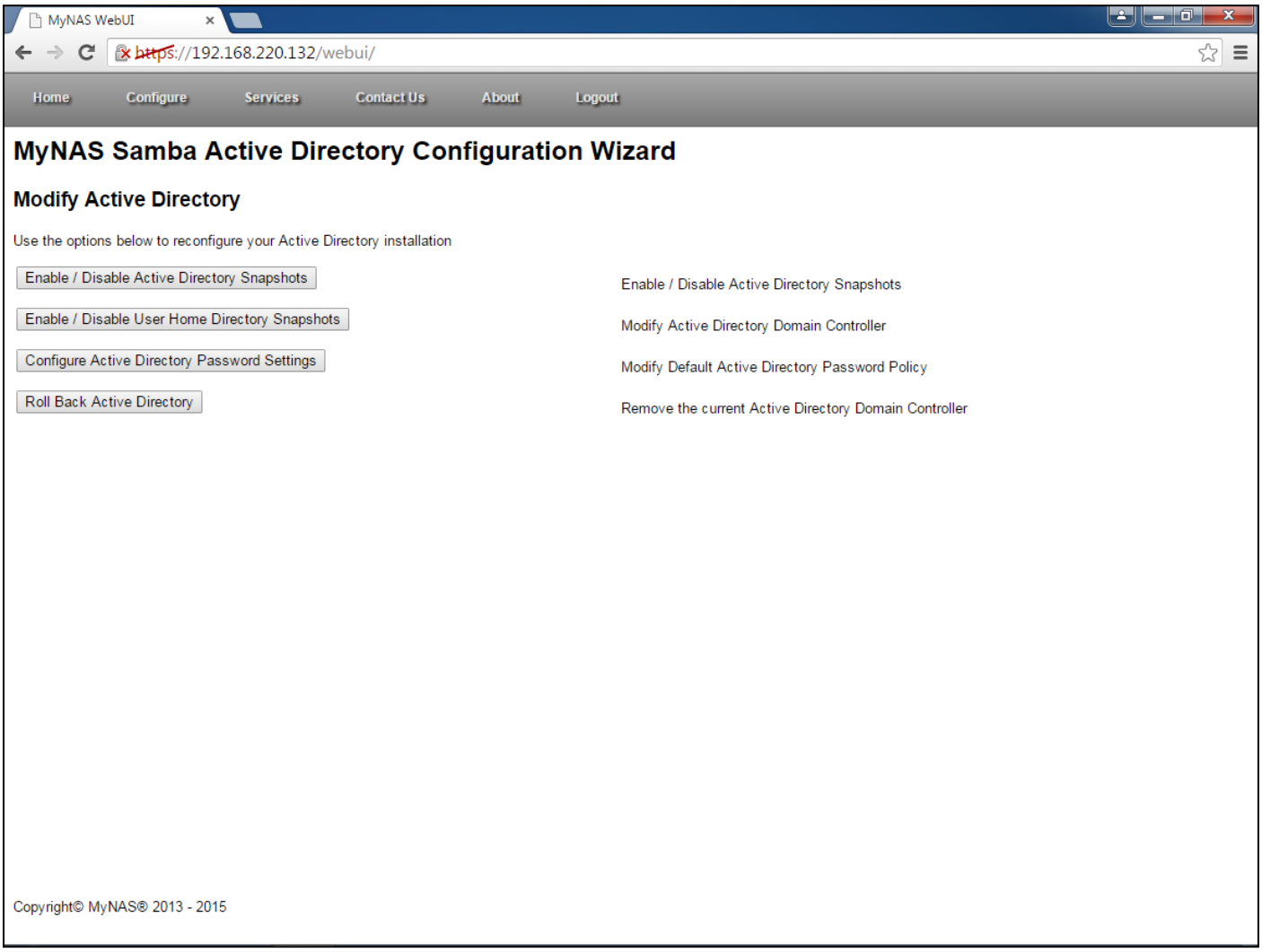


Any system that is capable of using Active Directory for authentication can now use your MyNAS Storage Appliance as their authentication source.

Modifying Active Directory

MyNAS provides the following for modifying the Active Directory installation:

- Enable / Disable Active Directory Snapshots
- Enable / Disable User Home Directory Snapshots
- Configure the Default Active Directory Password Policy
- Rolling back Active Directory



Enable / Disable Active Directory Snapshots

This allows for the re-configuration of snapshots against the Active Directory. If snapshots where not configured at installation time, they can be enabled here.

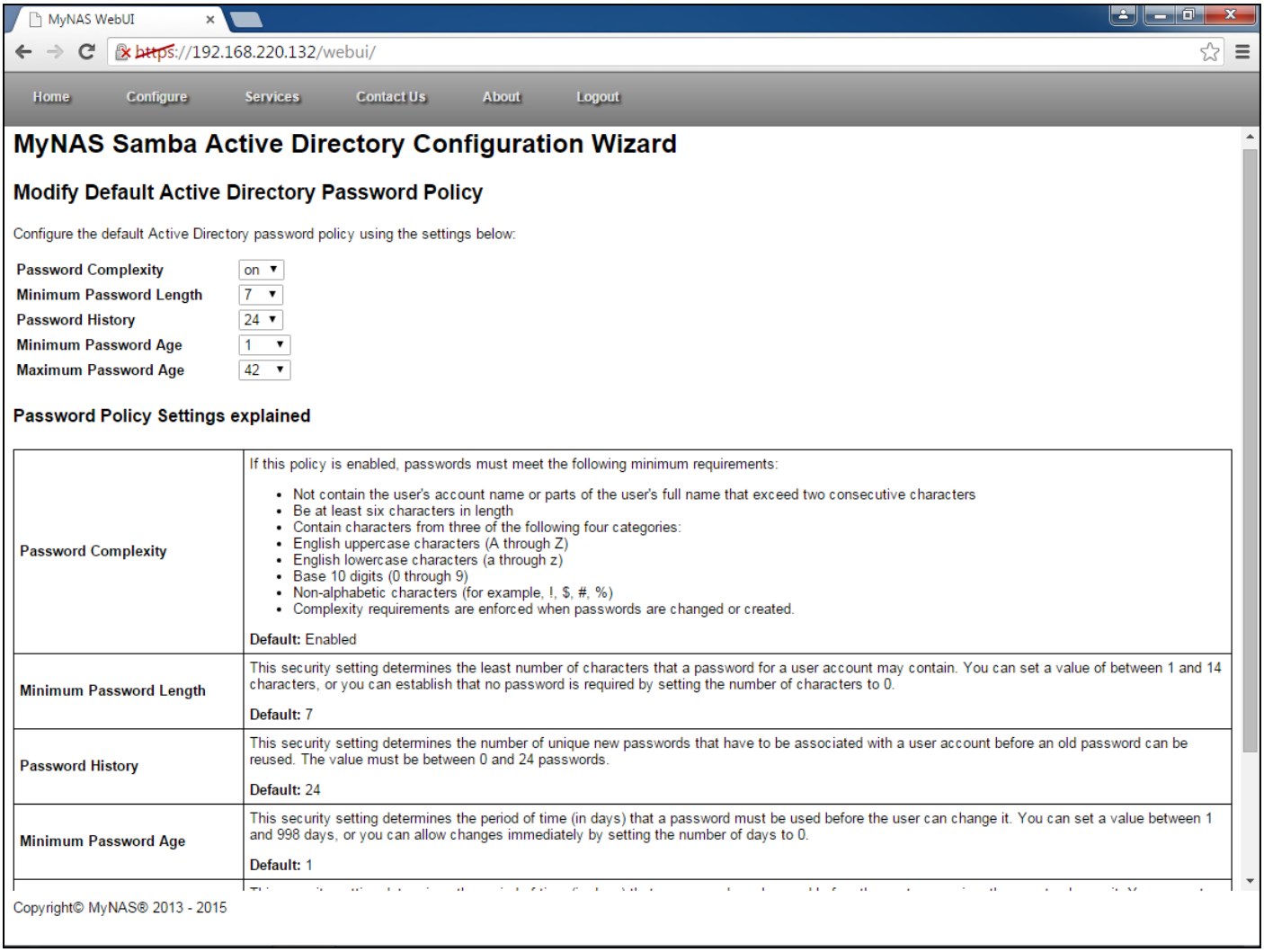
Enable / Disable User Home Directory Snapshots

By default, snapshotting of the User Home Directories does not occur. To change this behaviour, follow the prompts to configure snapshots for the user home directories.

Configure the Default Active Directory Password Policy

Currently, Samba does not support specific password policies as set via a Security Policy via GPO using the Active Directory Support Tools. MyNAS supports this by setting the domain password policies outside of the GPO.

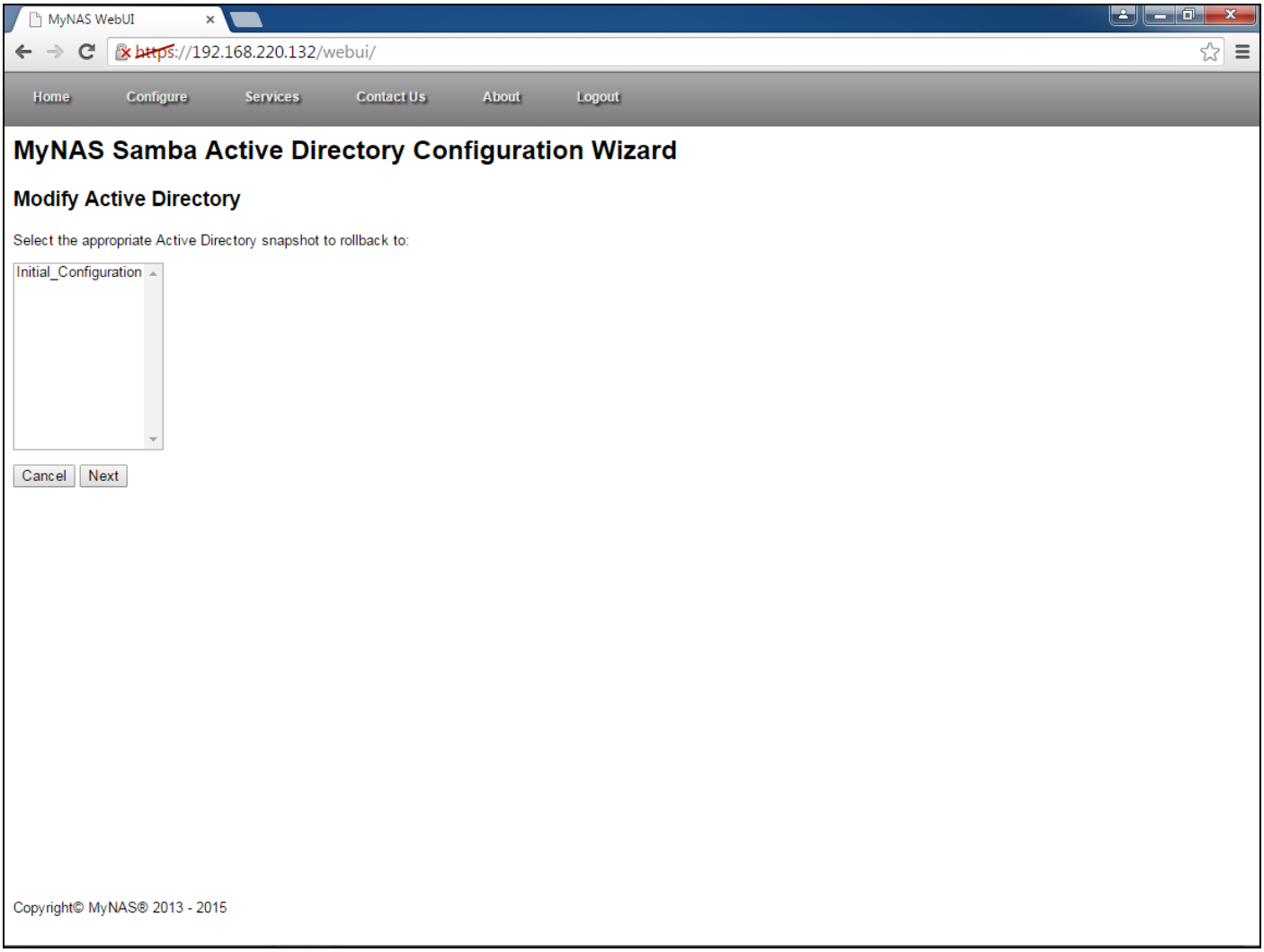
When clicking on the 'Configure Default Active Directory Password Policy' button the following will be displayed:



Once the new Domain password policy is configured, click 'Next' to confirm the settings. Once confirmed, click the 'Confirmed' button, then Finish to set the new policy on the domain.

Rolling back Active Directory

When performing an Active Directory rollback, this utilises the automatic snapshots created for the Active Directory database as configured. If no snapshots are configured, an initial configuration snapshot will be generated by default to provide the capability to roll back to an Active Directory clean-state. When clicking on 'Roll back Active Directory' button, the following will be displayed:



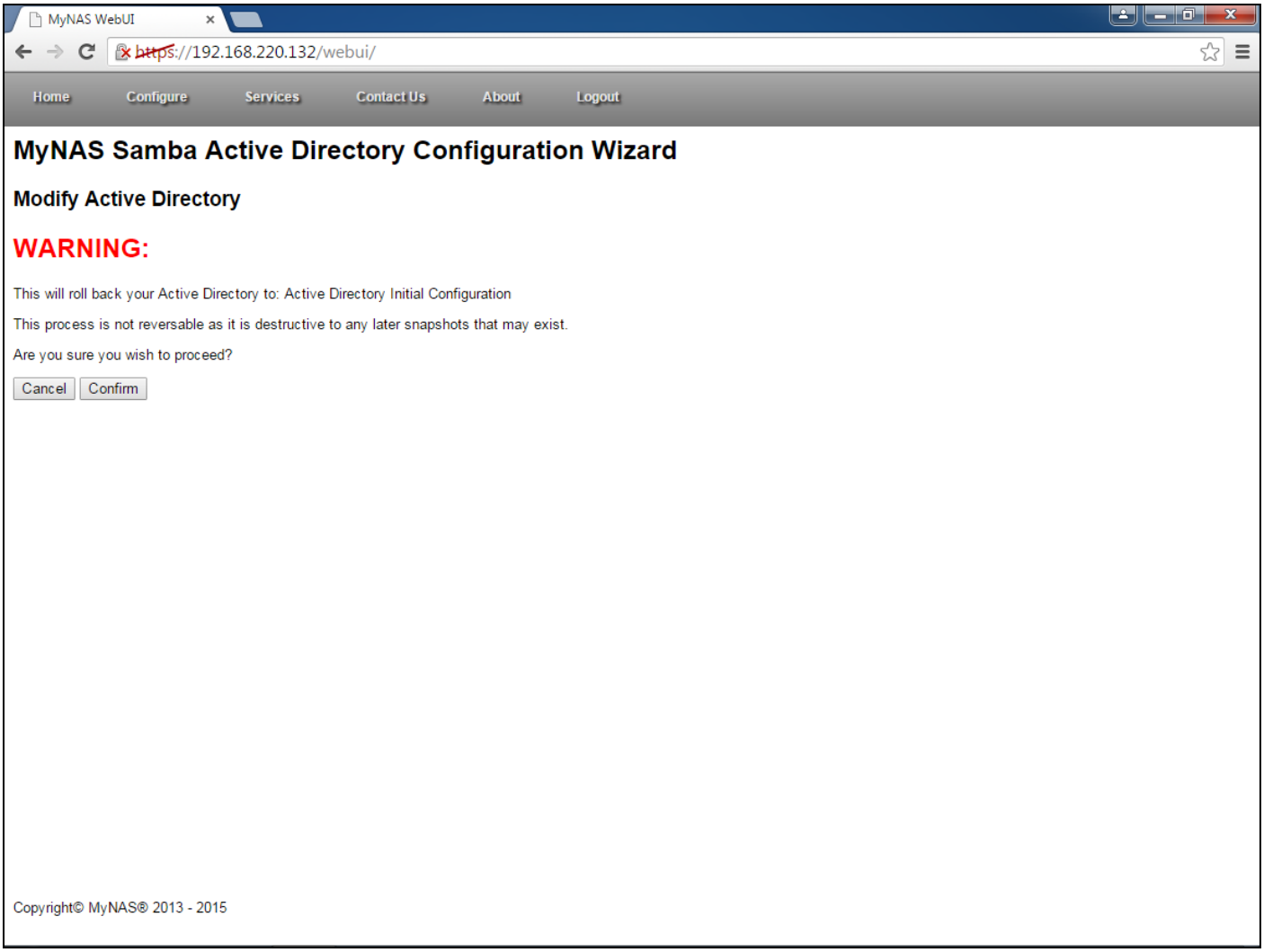
From the list of snapshots, select the snapshot to roll back to.

Note: Rolling back Active Directory to a specific snapshot is a destructive process. It will replace all the data in the Active Directory database, including any created user / group objects that do not exist in the snapshot being rolled back to. Any files or folder associated with those accounts may now be inaccessible until the permissions are resolved.

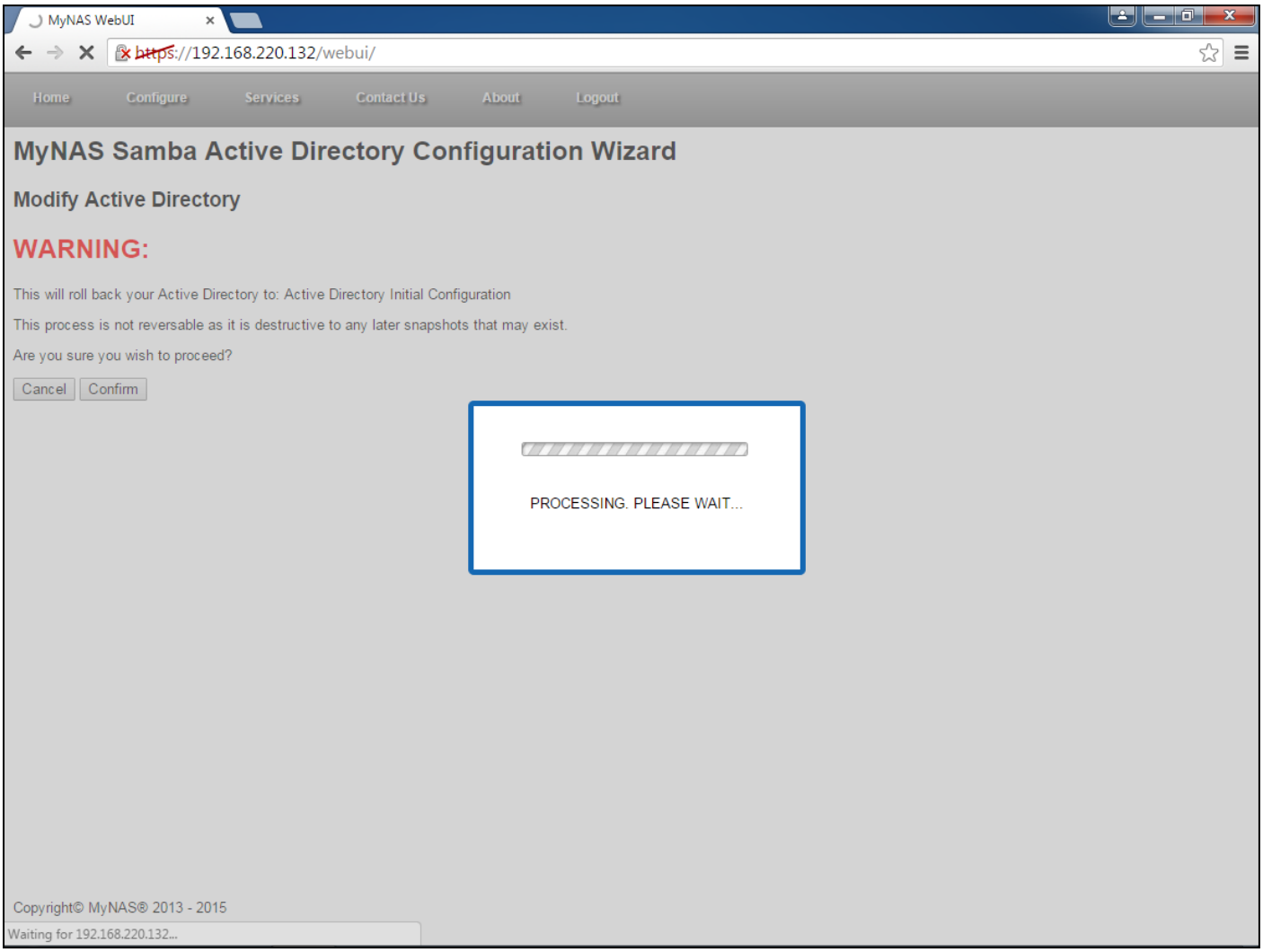
Note: All snapshots taken after the selected snapshot are also deleted. There is no roll-forward capability.

From the selection of snapshots, select the snapshot to roll-back to and click 'Next'

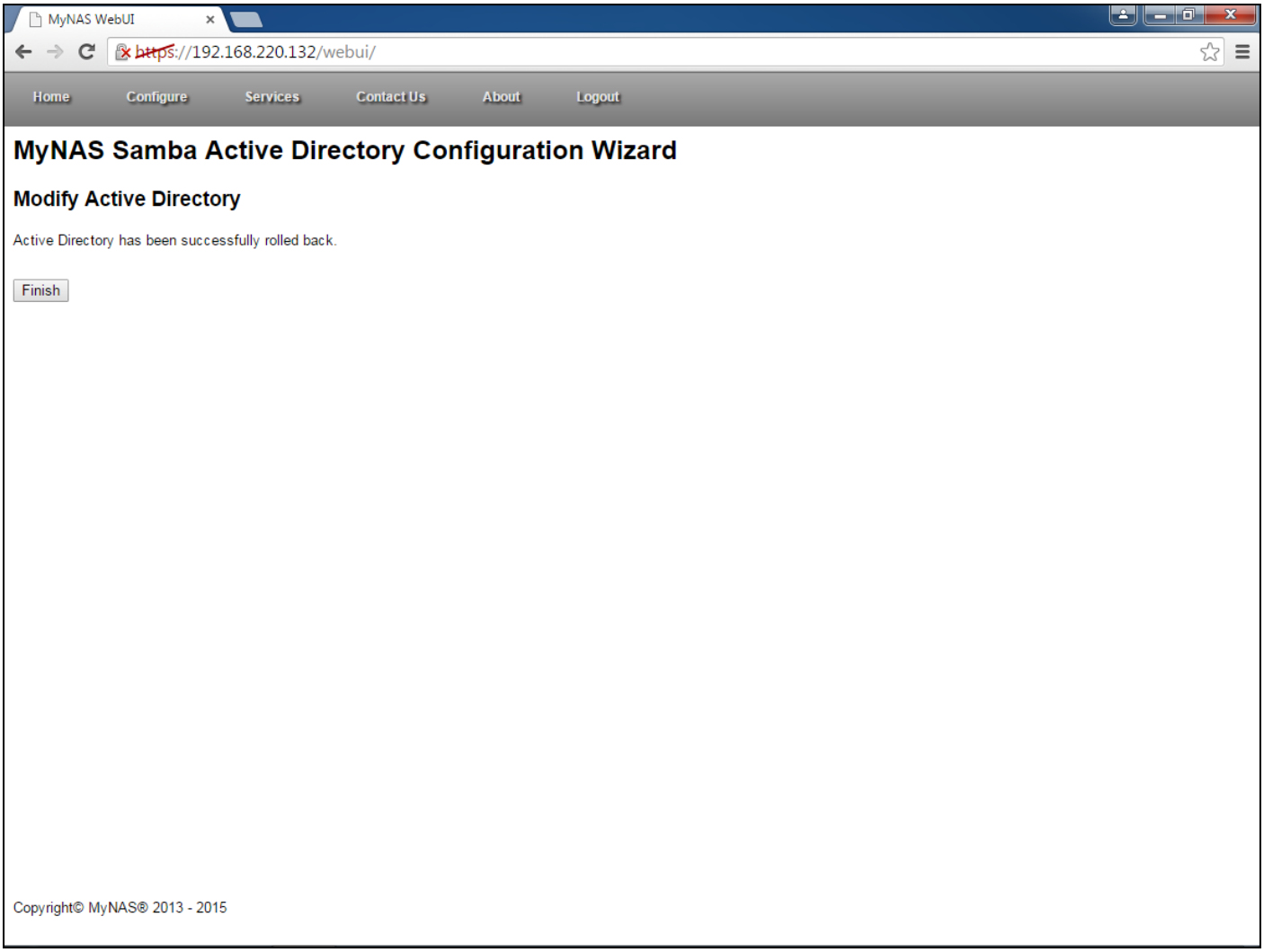
A warning will now be displayed detailing the destructive nature of the request and confirming the request to roll-back to the specific snapshot



To confirm the request, click 'Confirm'. MyNAS will now re-configure Active Directory to the selected snapshot and will restart the Samba Active Directory services.



Once the rollback is complete, the following will be displayed.

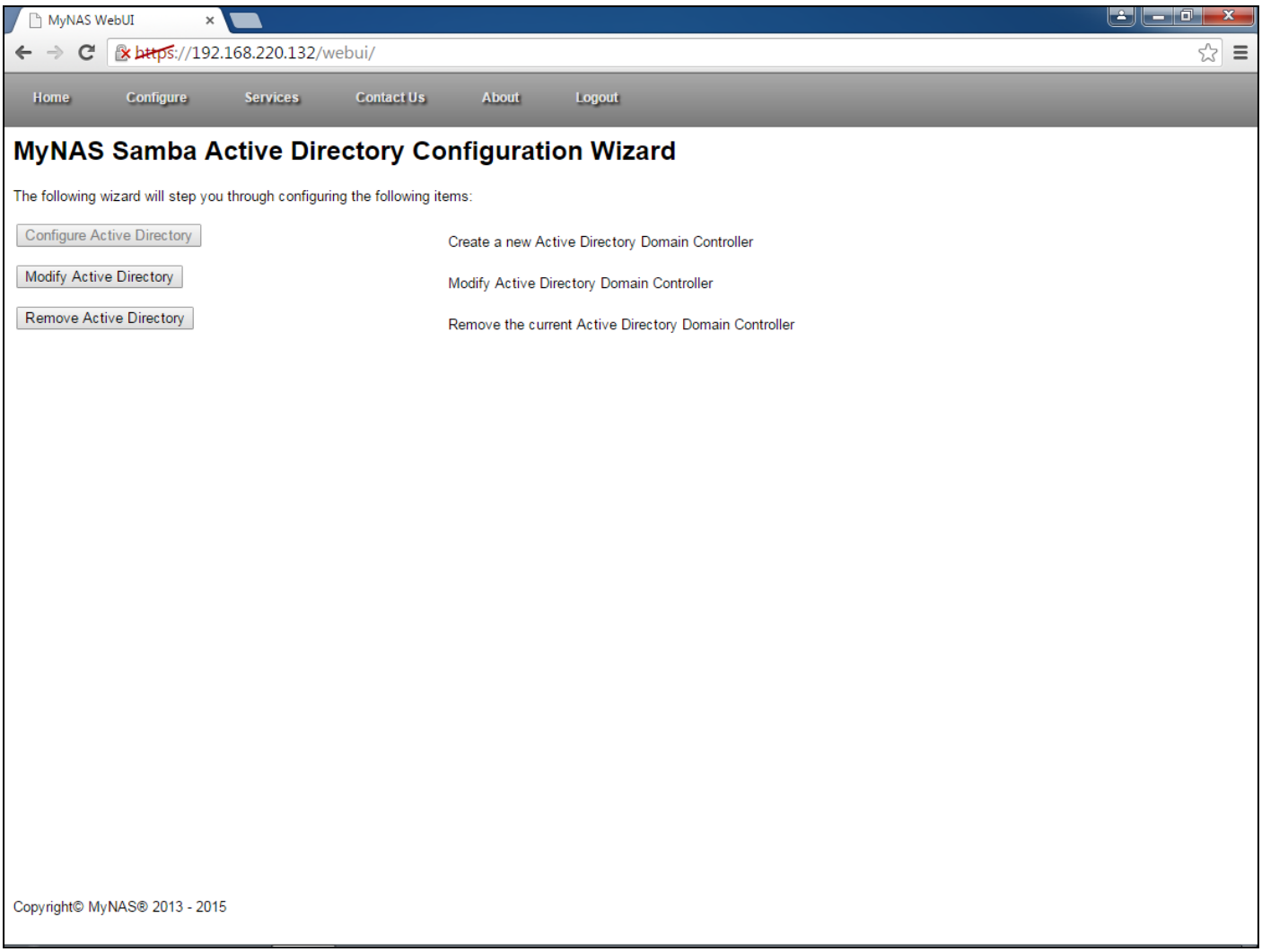


Click 'Finish' to complete the process.

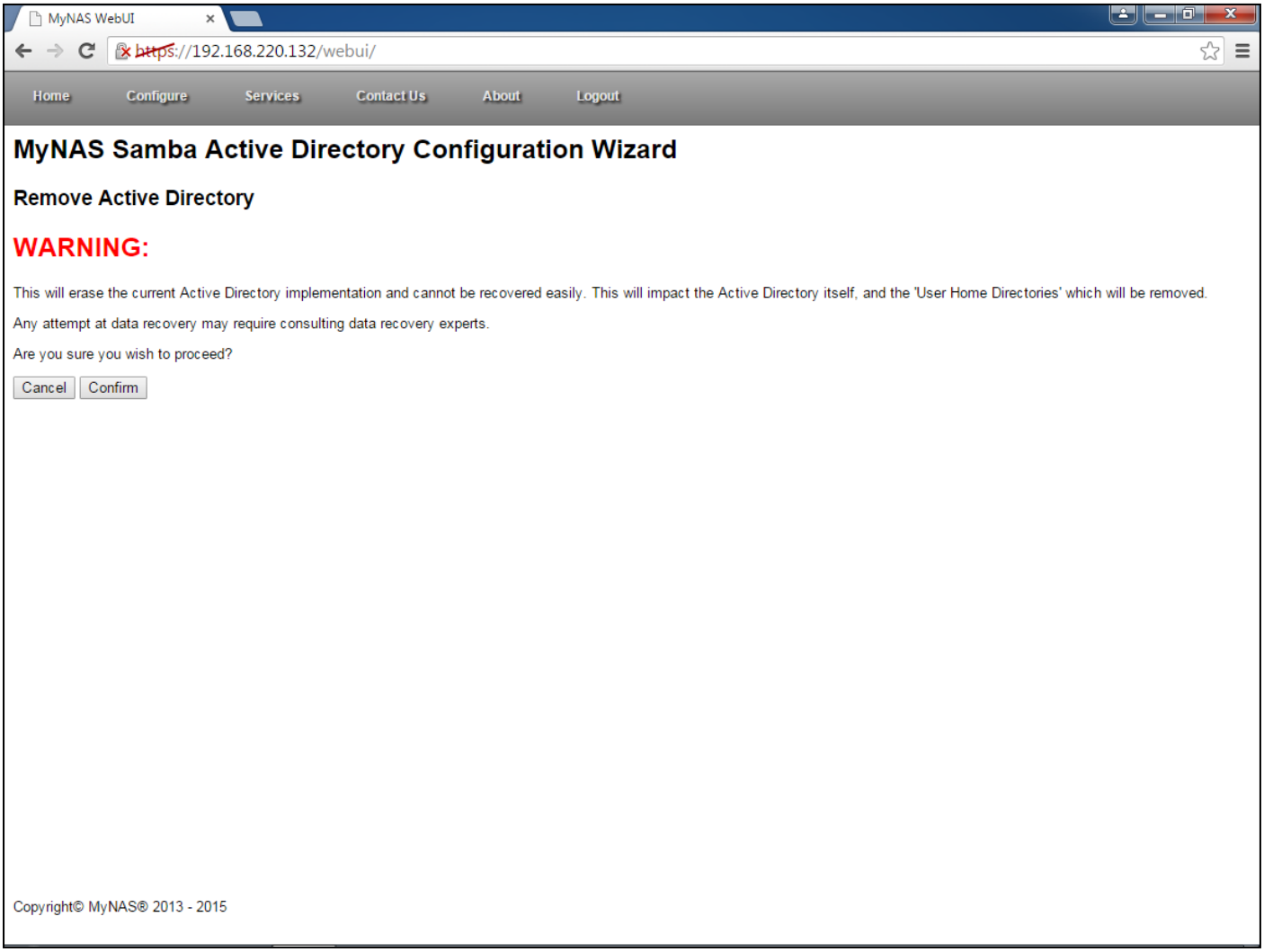
Deleting Active Directory

Deleting Active Directory is a destructive process. It will remove all data on the disks associated with Active Directory - mainly the Active Directory itself and the User Home Directories.

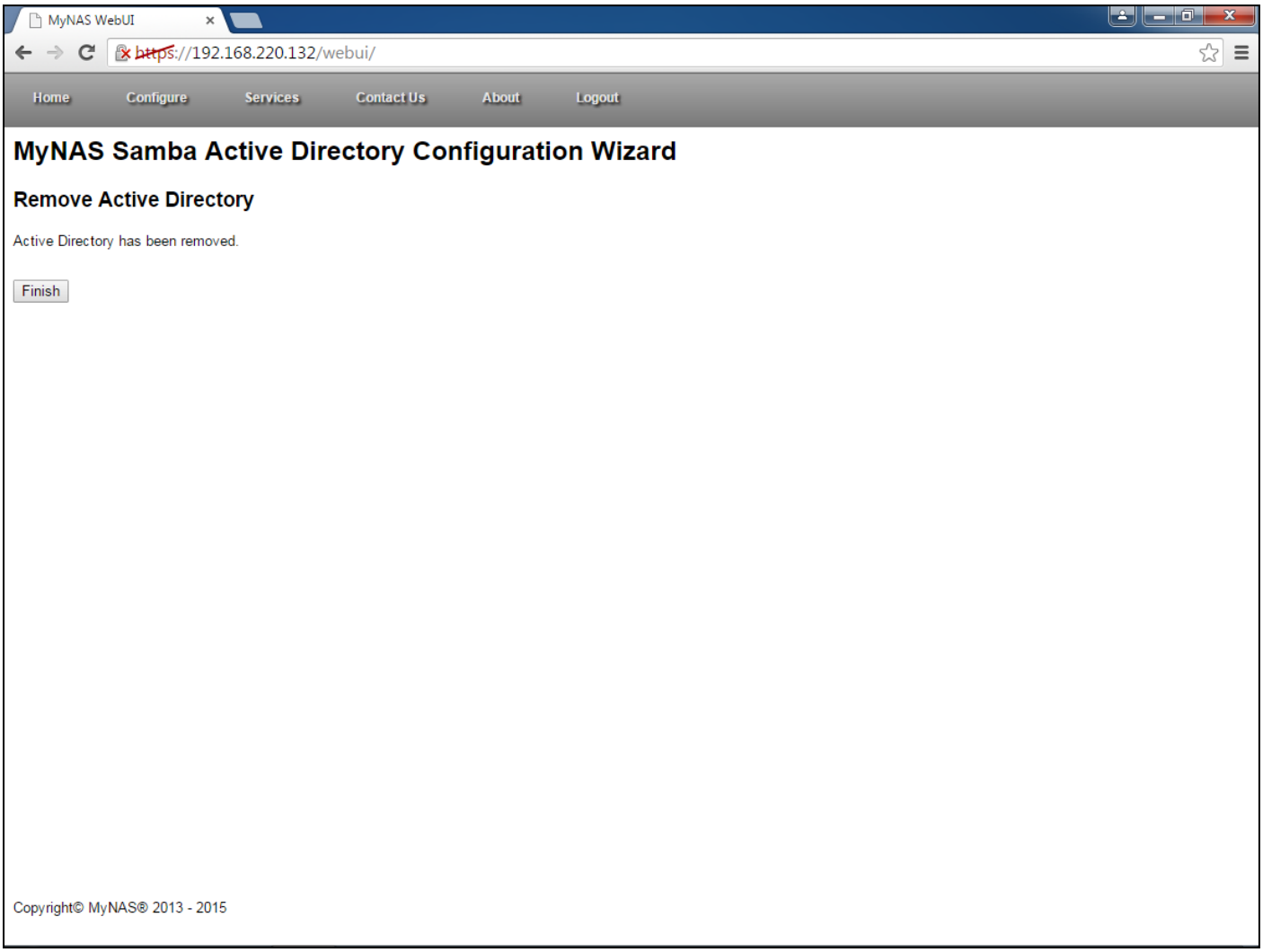
From the WebUI login page, login as the enable user. Click on the 'Configure' menu bar item, and select 'Configure Active Directory' to bring up the Configure Active Directory Configuration wizard. To remove Active Directory, click on the 'Remove Active Directory' button



A warning will be displayed detailing that this removal is a destructive process



To complete the removal, click the 'Confirm' button and MyNAS will remove Active Directory and re-configure the system to operate without Active Directory. Once Active Directory has been removed, the following will be displayed:



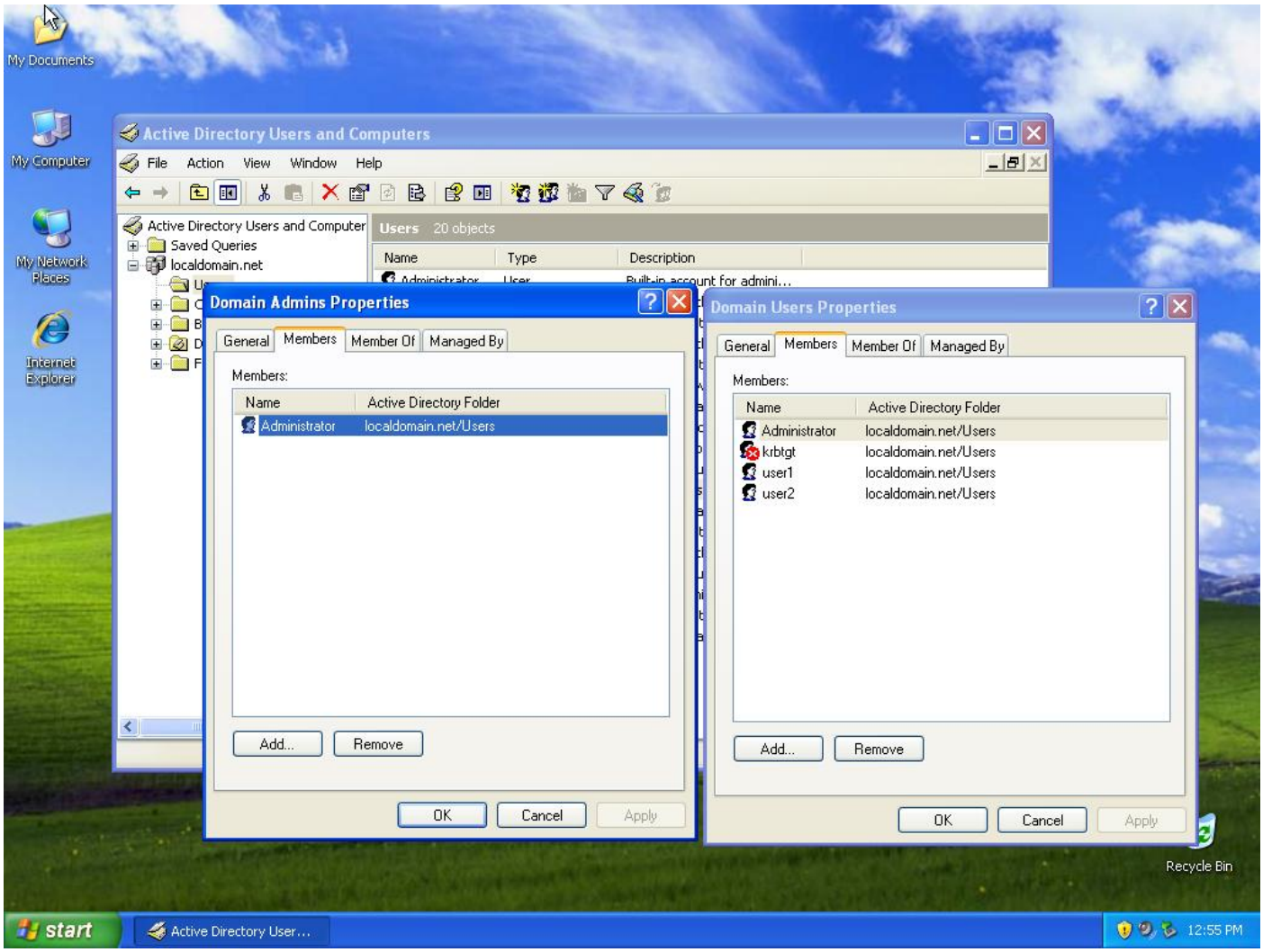
Click 'Finish' to complete the wizard.

Modifying a Data Share to use Advanced Permissions

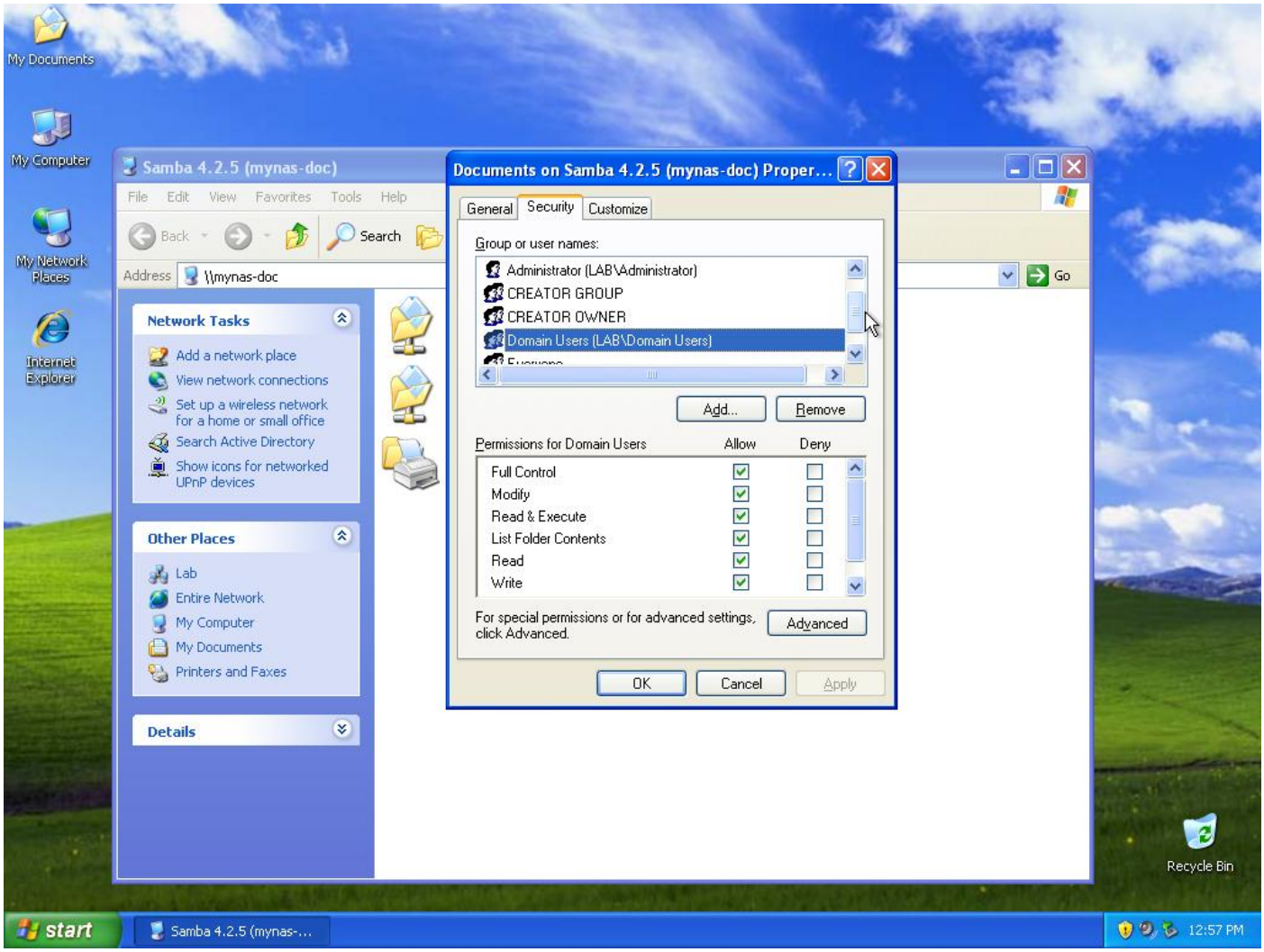
Once either local users & groups or Active Directory is configured, a Data Share will now be able to have additional security and permissions assigned to the specific share.

A Data Share can be configured with advanced permissions either at creation time, or after the Data Share has been created.

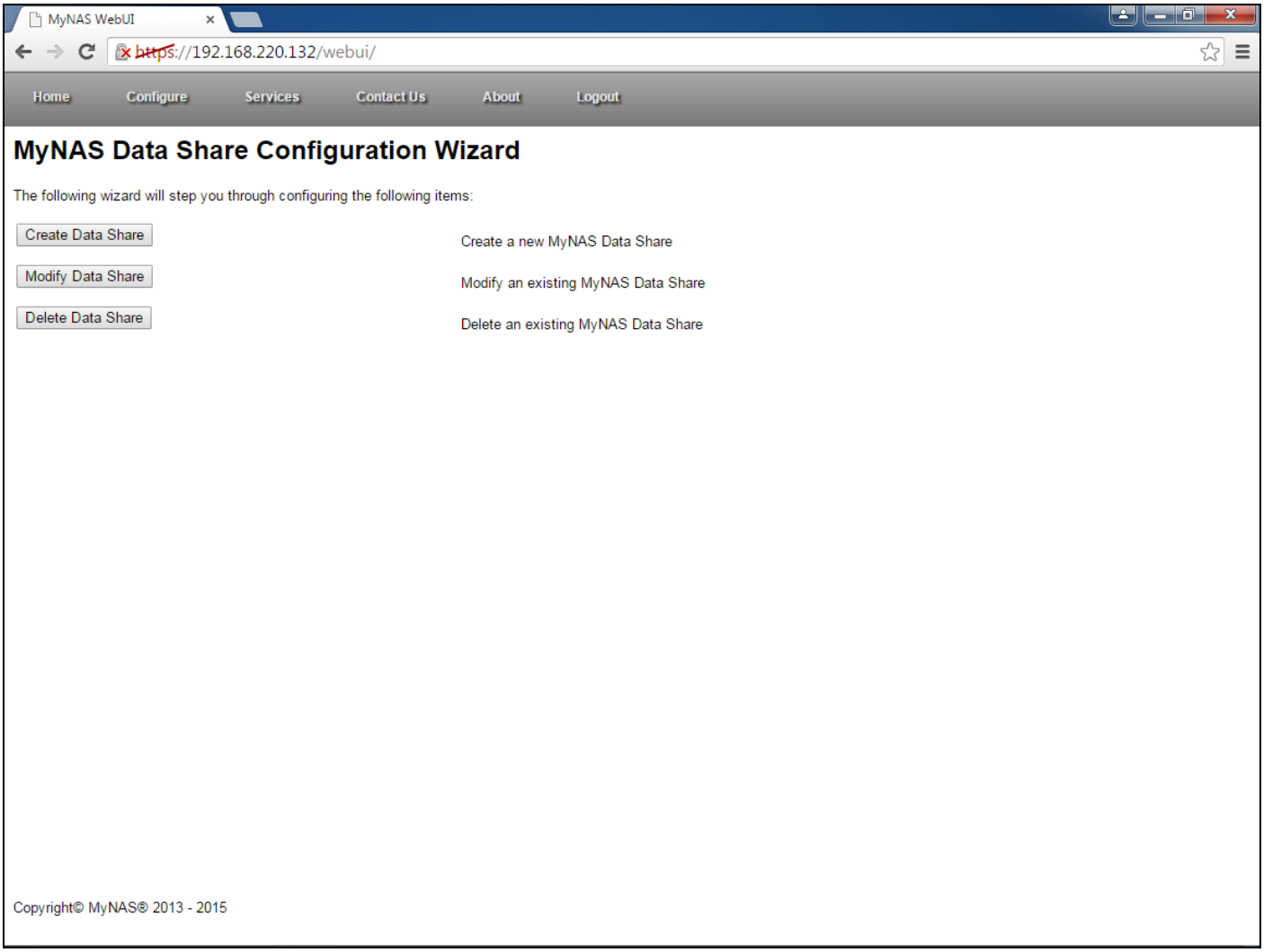
For the purpose of this section, Active Directory will be used, with the following configuration:



Initial folder permissions detailed below:

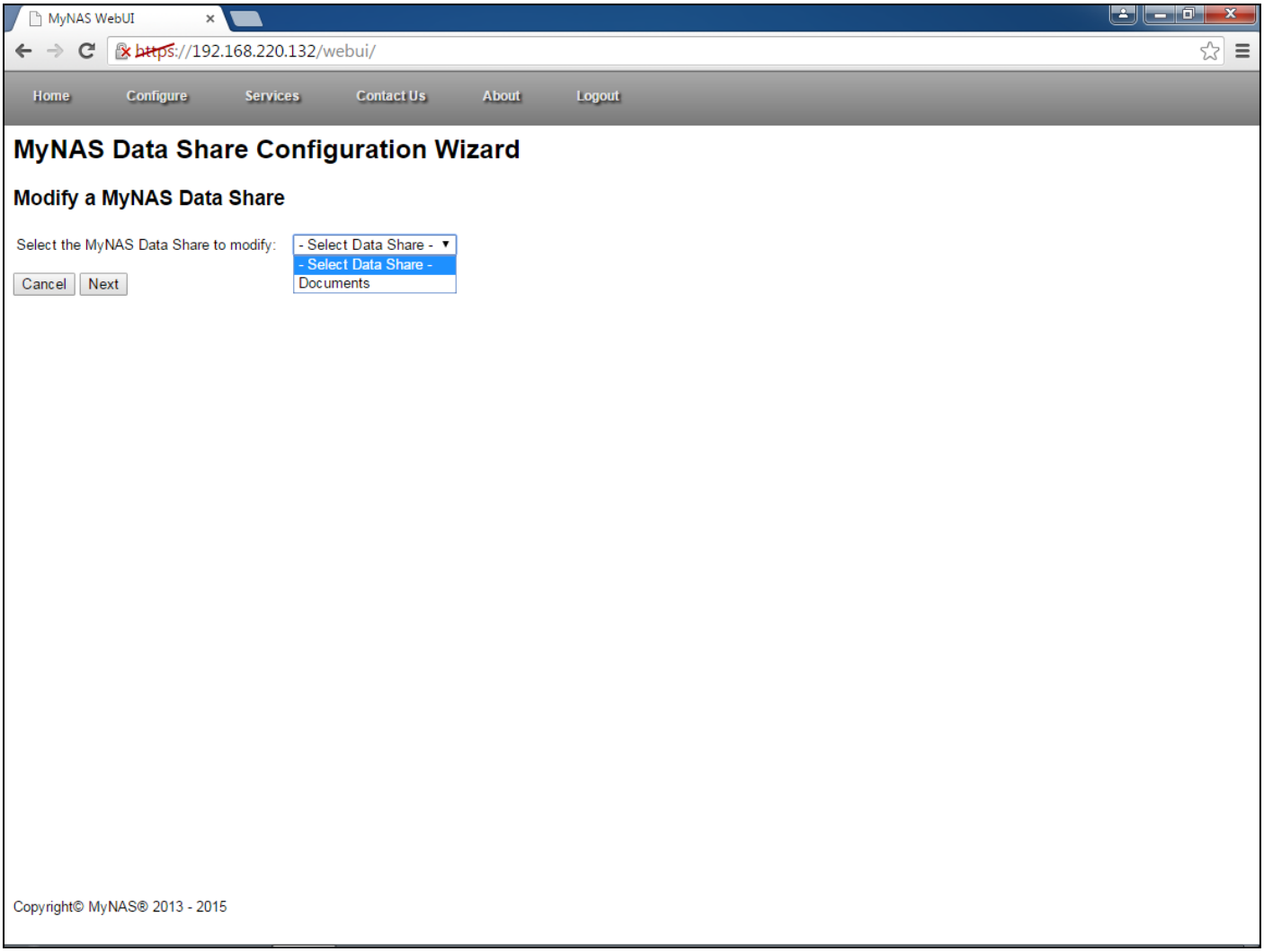


Login to the WebUI as the enable user, and from the Configure menu item, select 'Configure Data Shares'. Once selected, the following will be displayed:



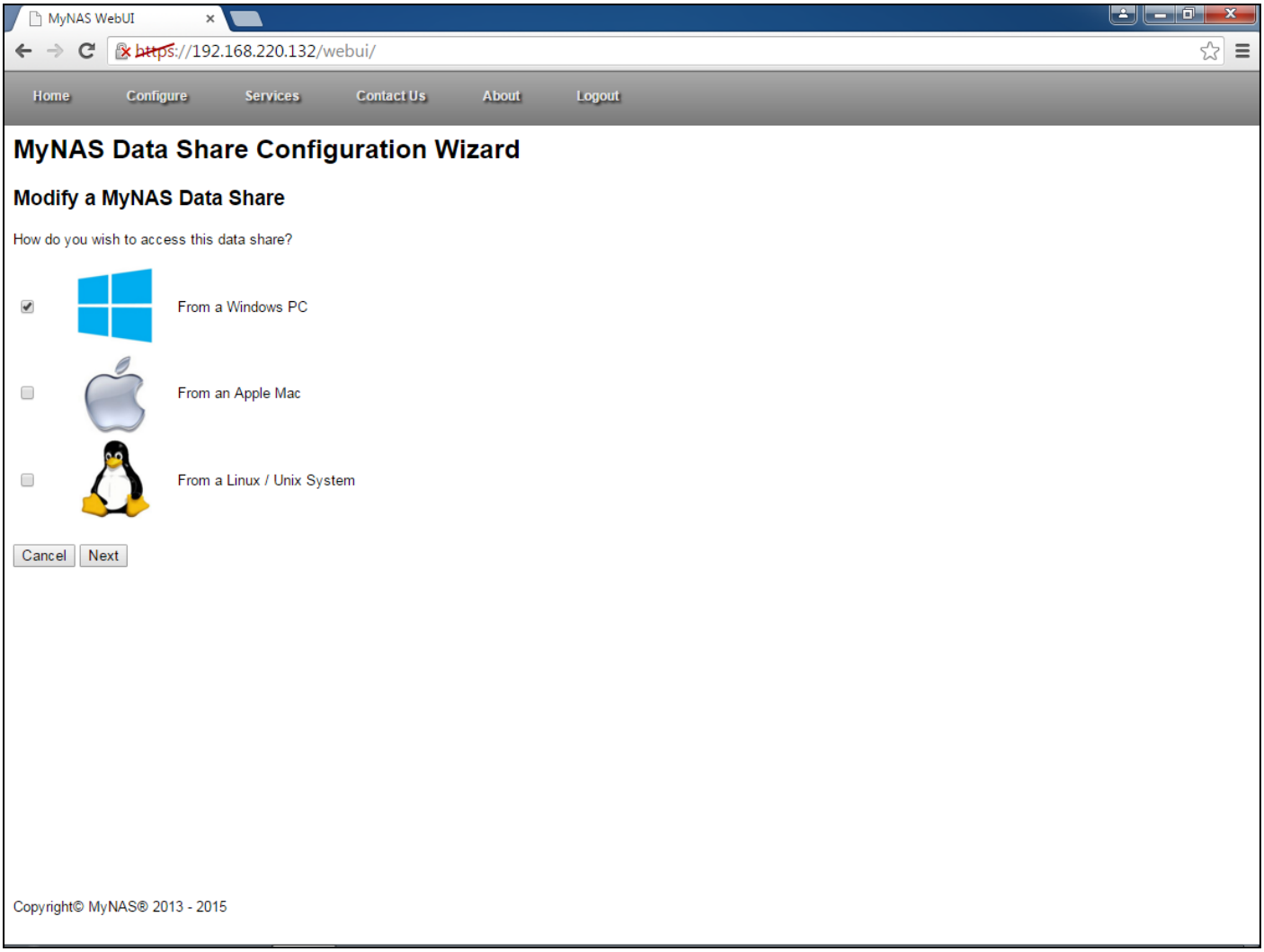
To modify a Data Share, click the 'Modify Data Share' button.

Select the Data Share which you wish to modify



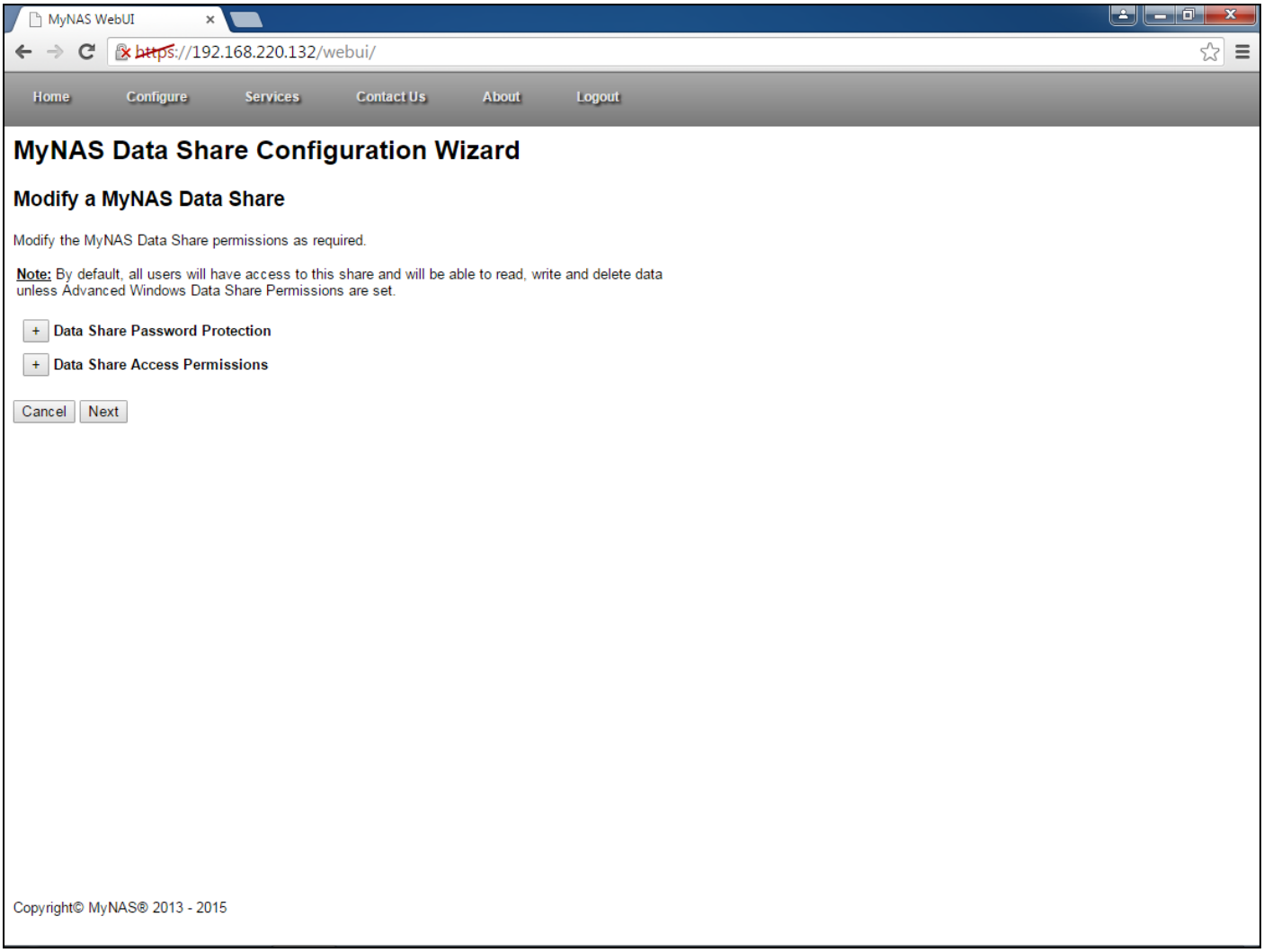
Click 'Next' once the appropriate data share is selected. Click 'Next' to bypass modification of the share name and comment if no change there is required.

If you require to change the data share access, make the appropriate changes, otherwise click 'Next'



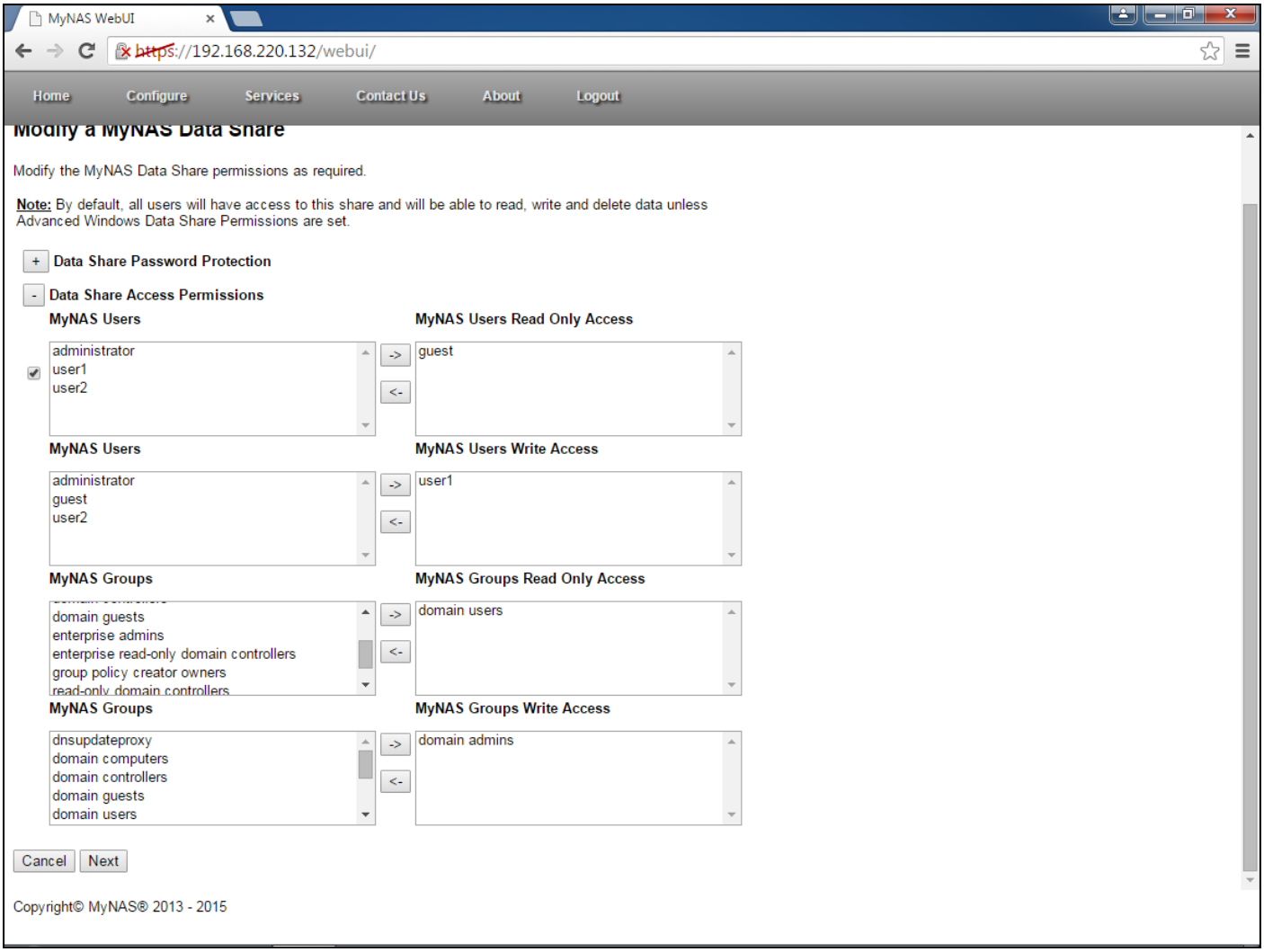
The next page details the advanced permissions that can be applied to a share. These are:

- Specific user or group access
- Individual user or group access for read / write control



To apply permissions, click on the '+' button to expand the applicable section.

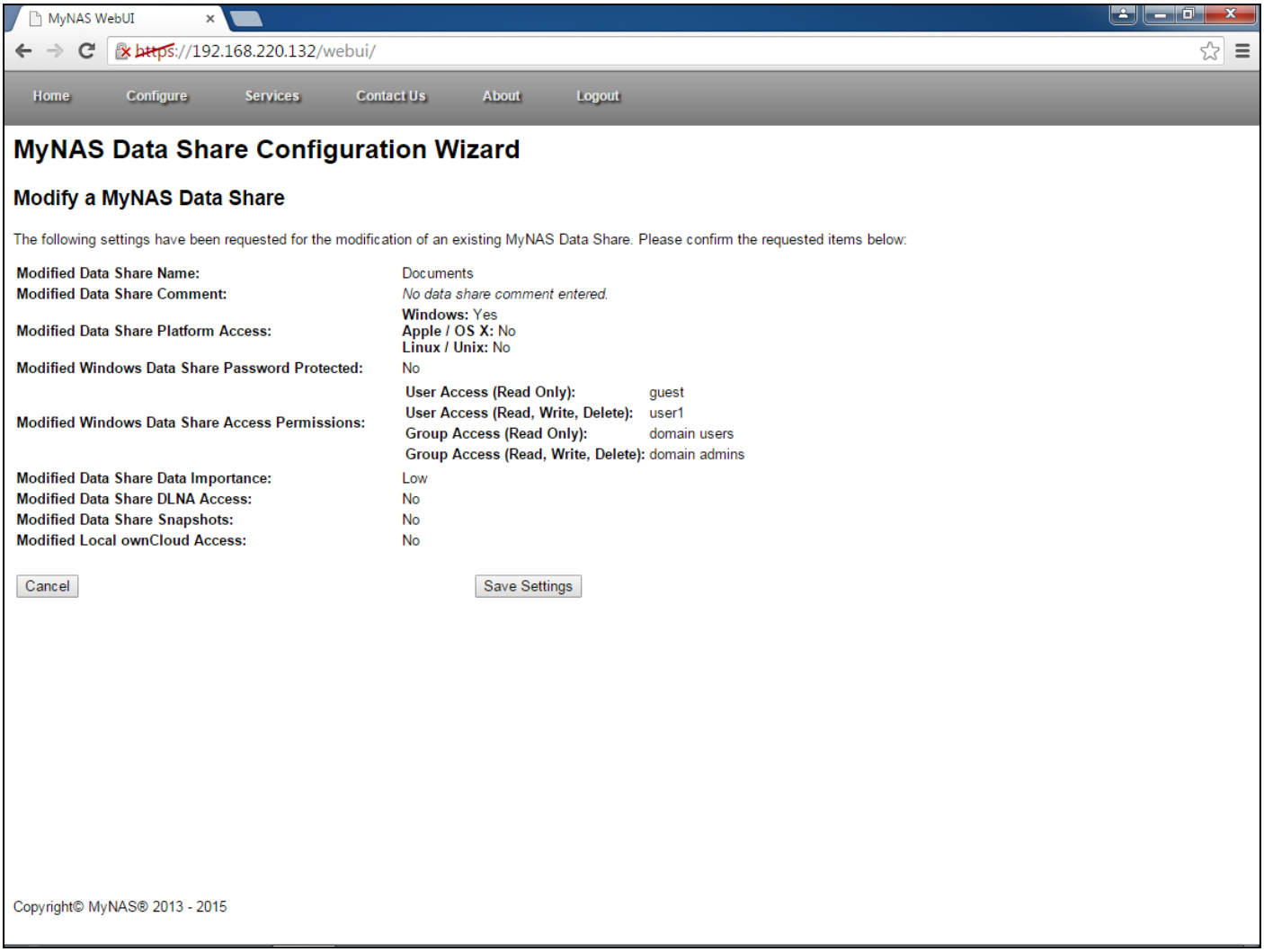
For applying permissions, the following will be applied to this Data Share:



Click 'Next' to continue.

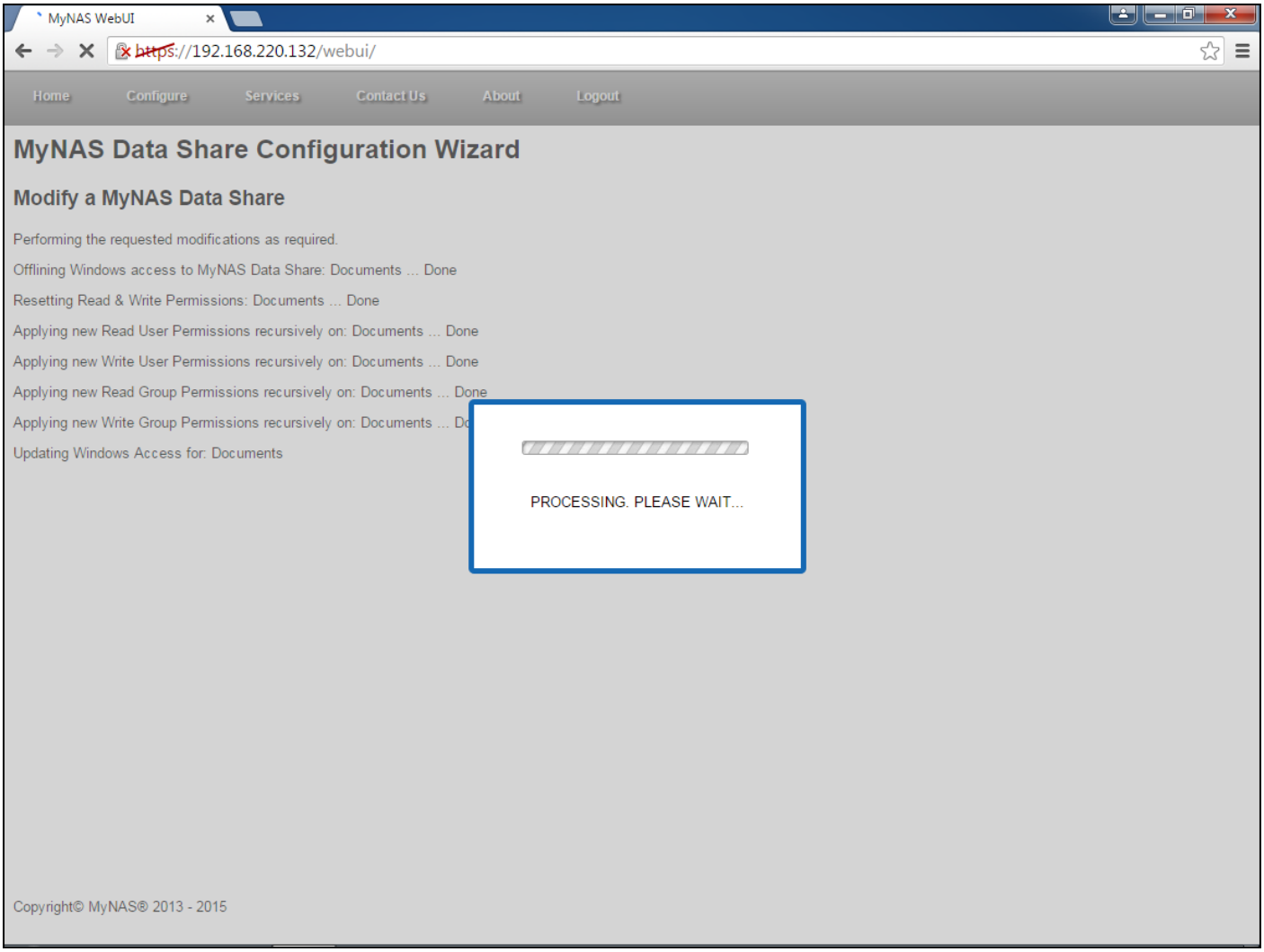
Complete any further modifications of the Data Share if required.

Confirm all the settings are as per required

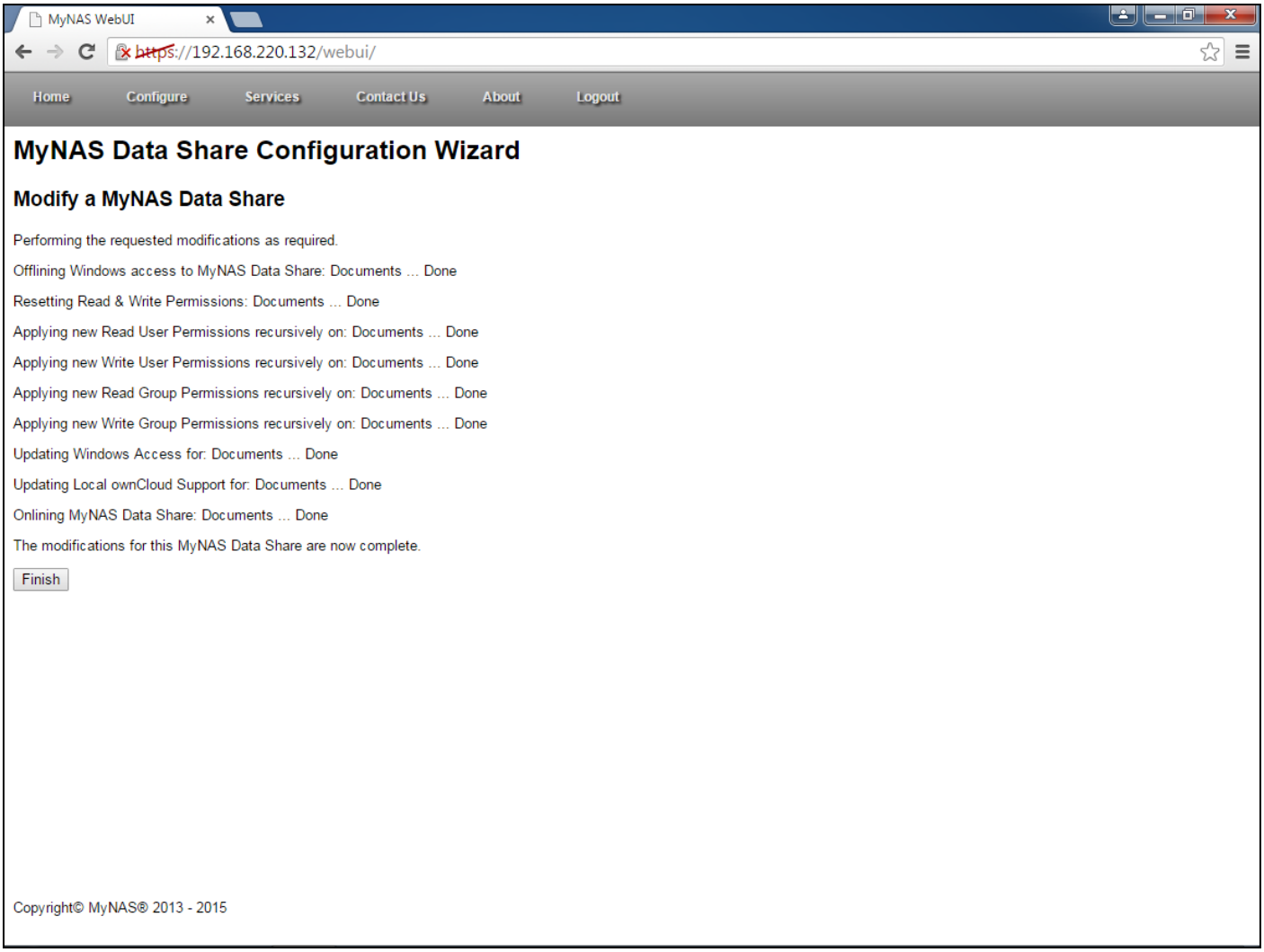


If all the permissions are OK, click 'Save Settings'

MyNAS will now process the changes as requested to the Data Share

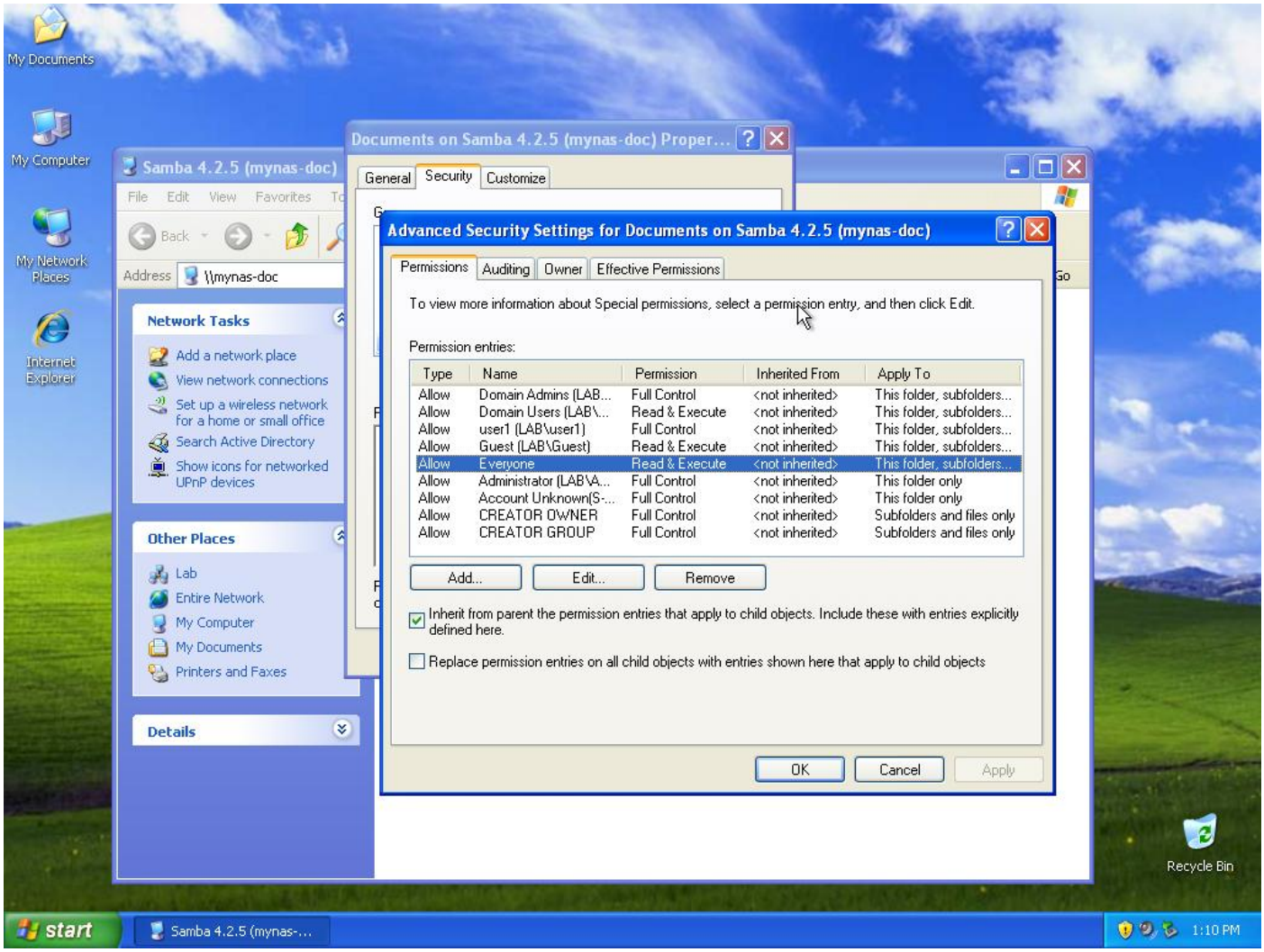


Once the changes are complete the following will be displayed:



Click 'Finish' to complete the process.

Validate the applied share permissions via a Windows system connected to the Active Directory domain:

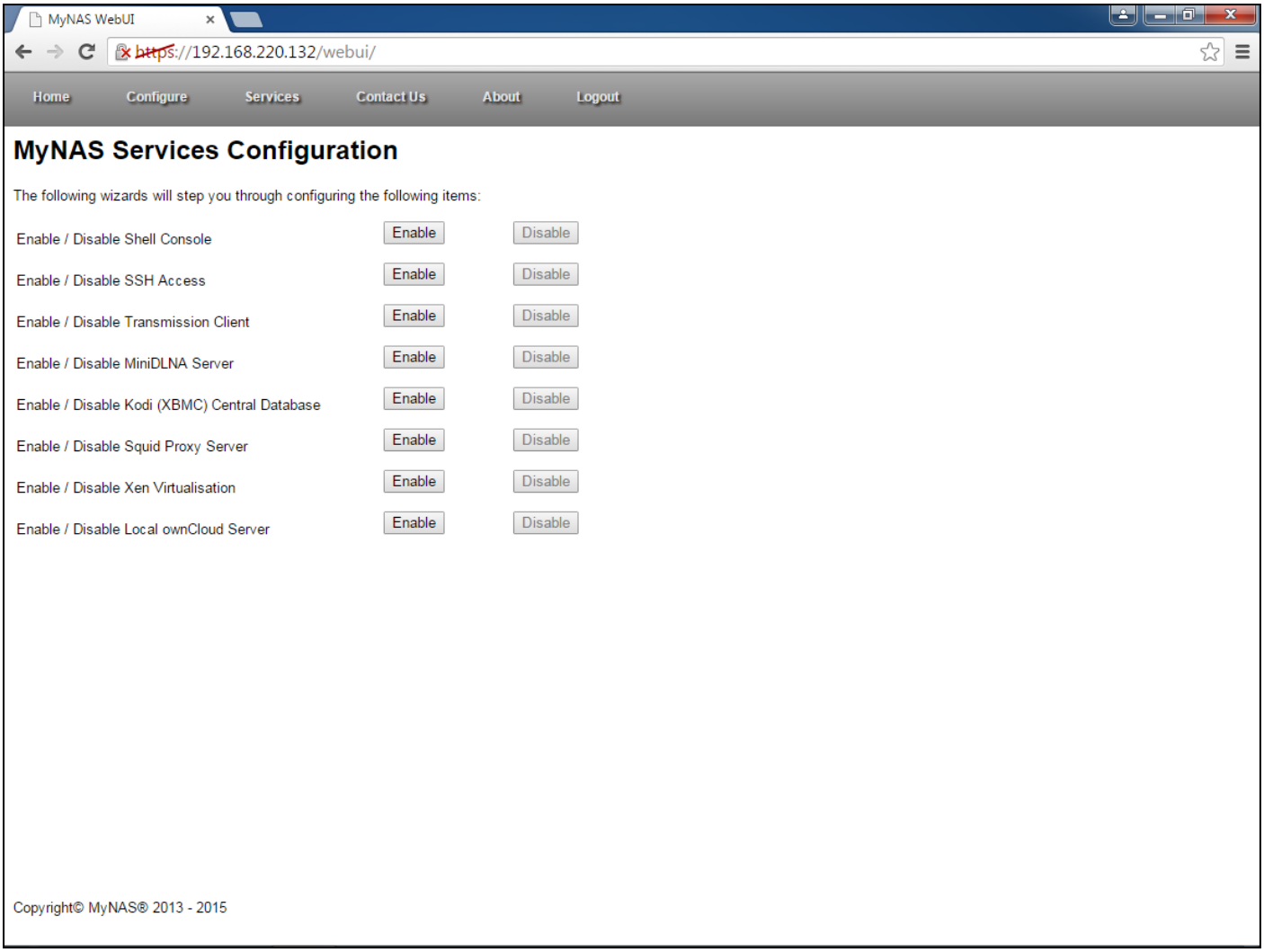


Configuring Additional MyNAS System Services

MyNAS also provides the following functionality:

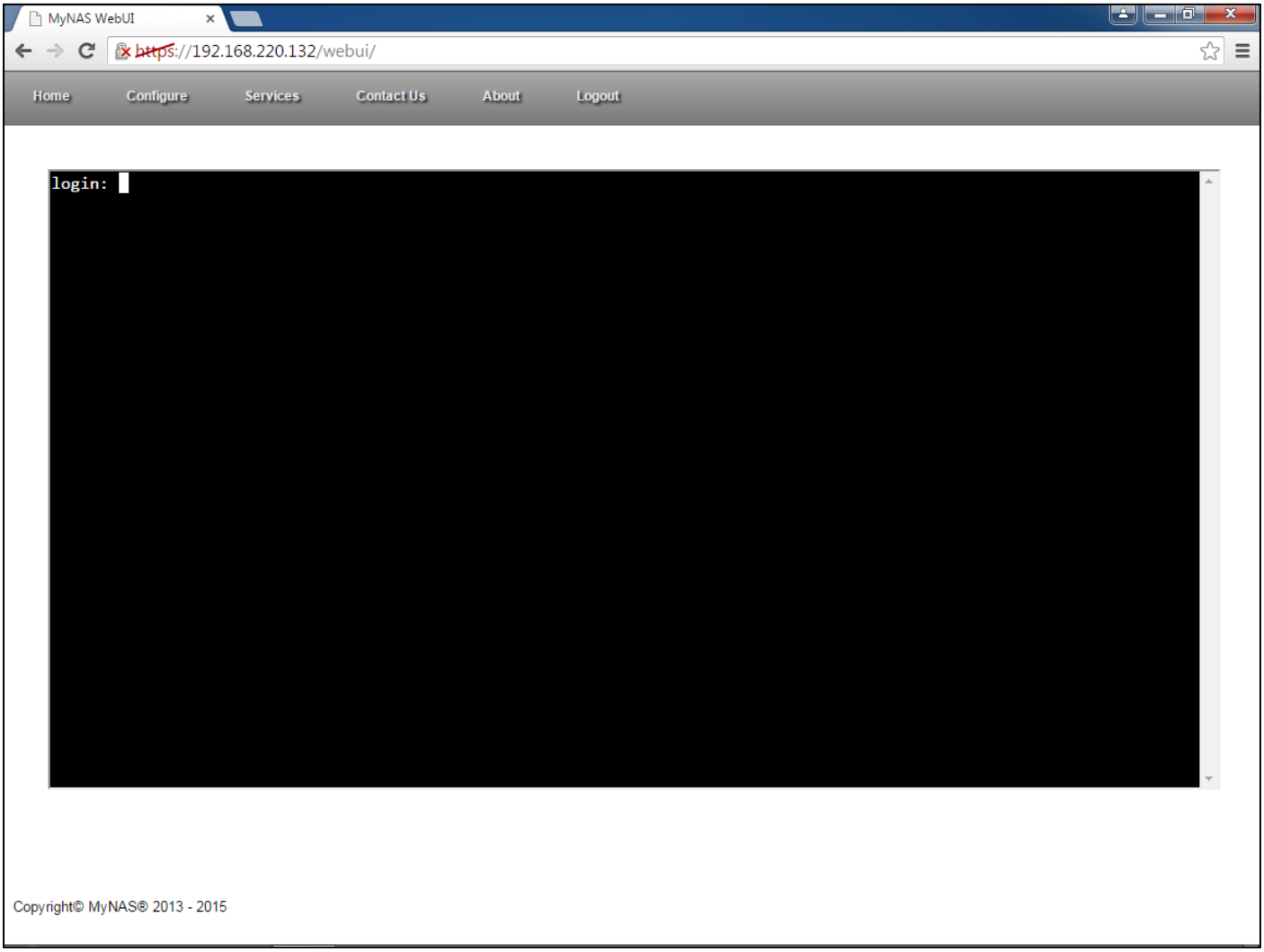
- Embedded shell console
- Embedded BitTorrent Client
- SSH Access
- DLNA Server
- XBMC Central Database
- Squid Proxy Server
- Xen Virtualisation
- Local ownCloud Server

To configure any of these additional services, login to the WebUI as the enable user, and from the Configure menu item, select 'Configure System Services'. Once selected, the following will be displayed:



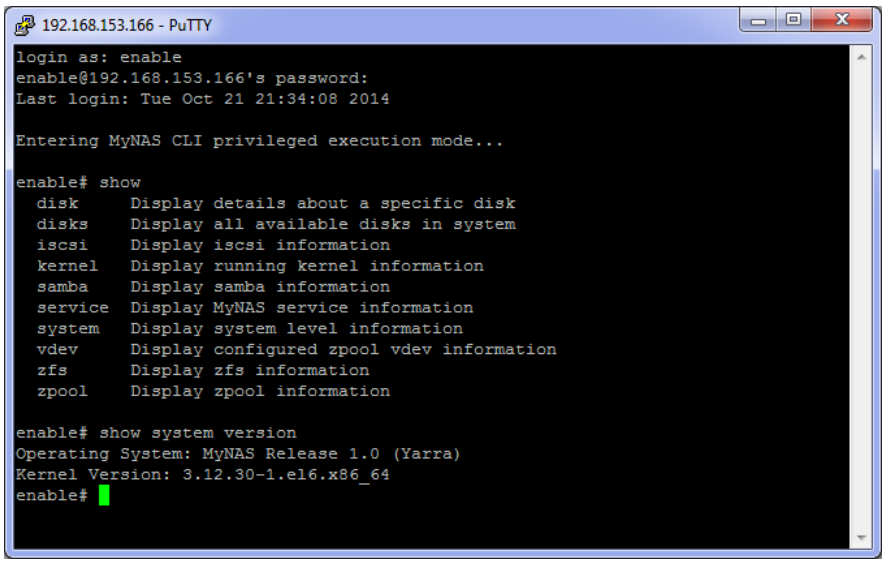
Enable / Disable Shell Console

From the WebUI, simply click the appropriate button to Enable / Disable the Shell Console. Once enabled, click on the 'Services' menu, then 'Shell Console' to bring up the fully functional shell console.



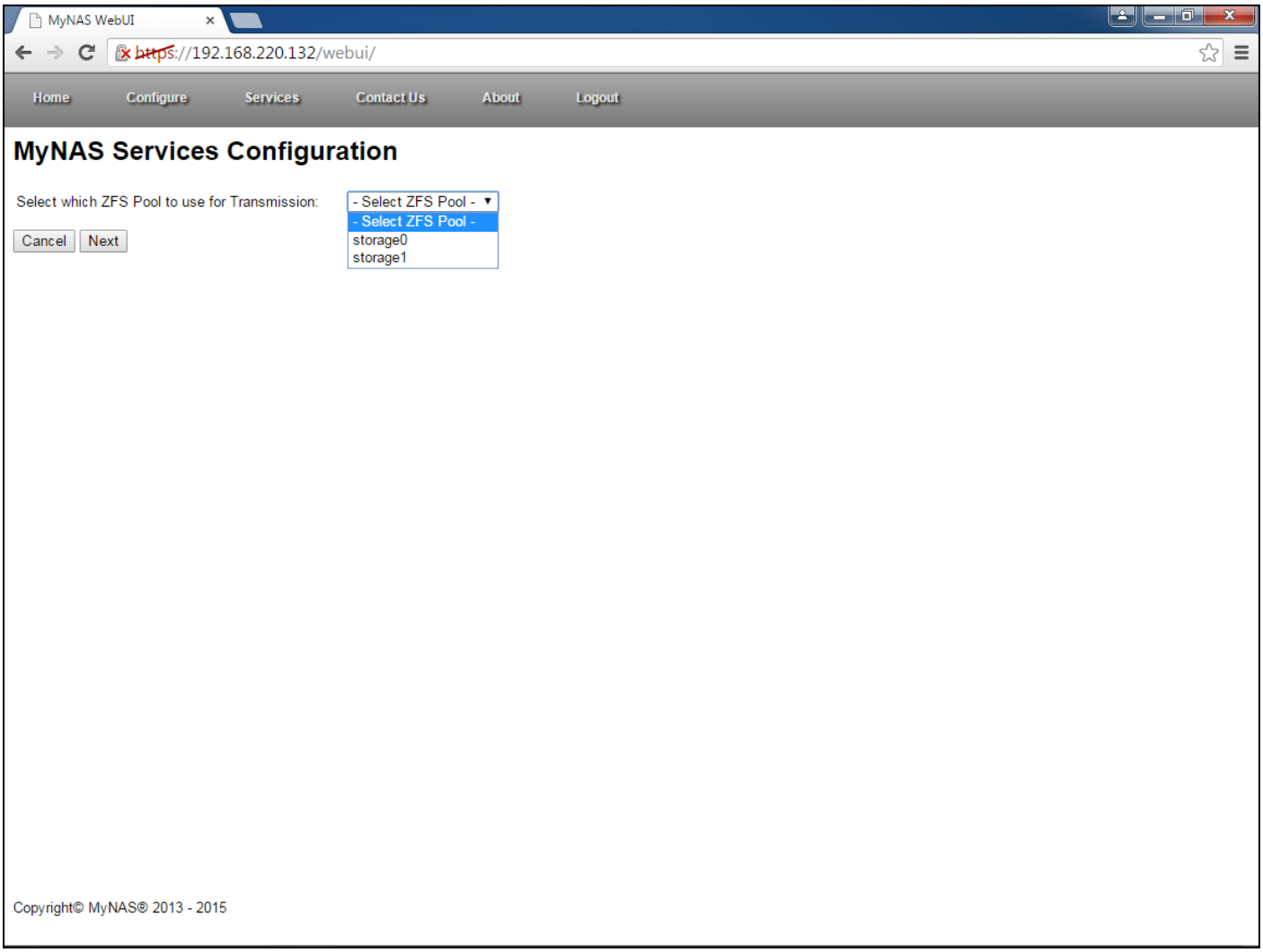
Enable / Disable SSH Access

From the WebUI, simply click the appropriate button to Enable / Disable the SSH Access. Once enabled, you will be able to use a SSH Client to access the CLI of MyNAS:

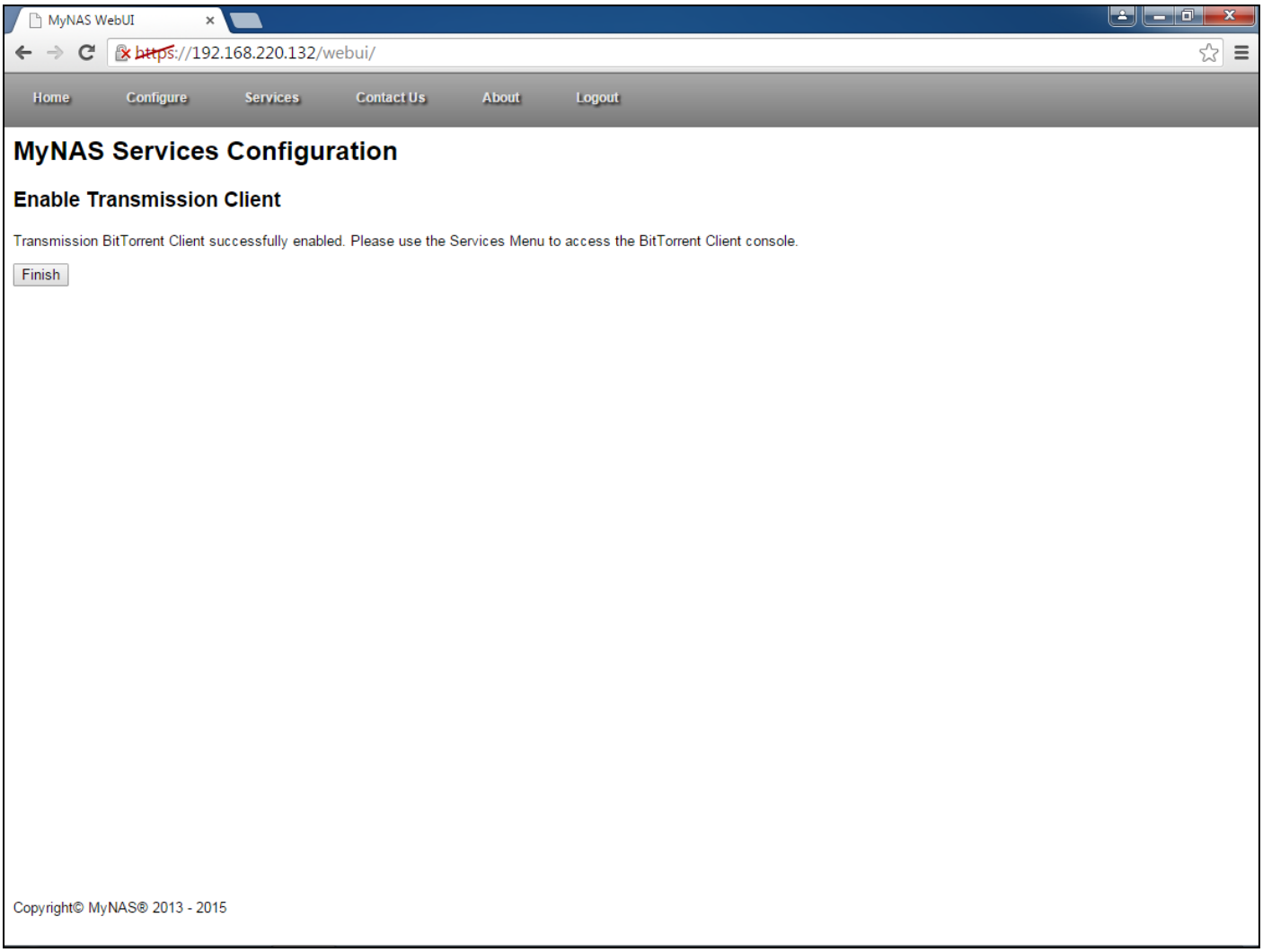


Enable / Disable BitTorrent Client

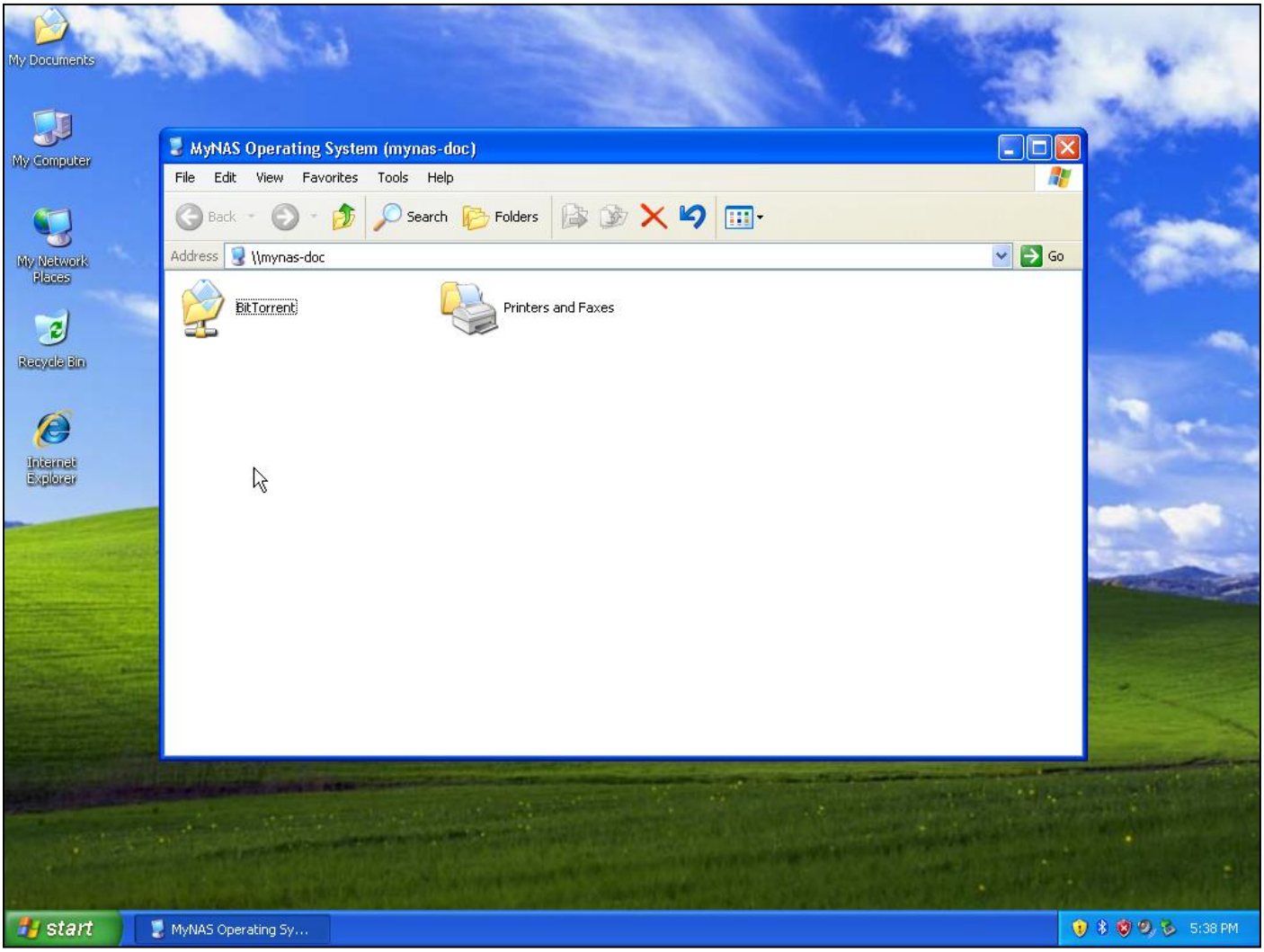
From the WebUI, simply click the appropriate button to Enable / Disable the Transmission Client. Depending on the ZFS Pool configuration, if there are more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for the Transmission data:



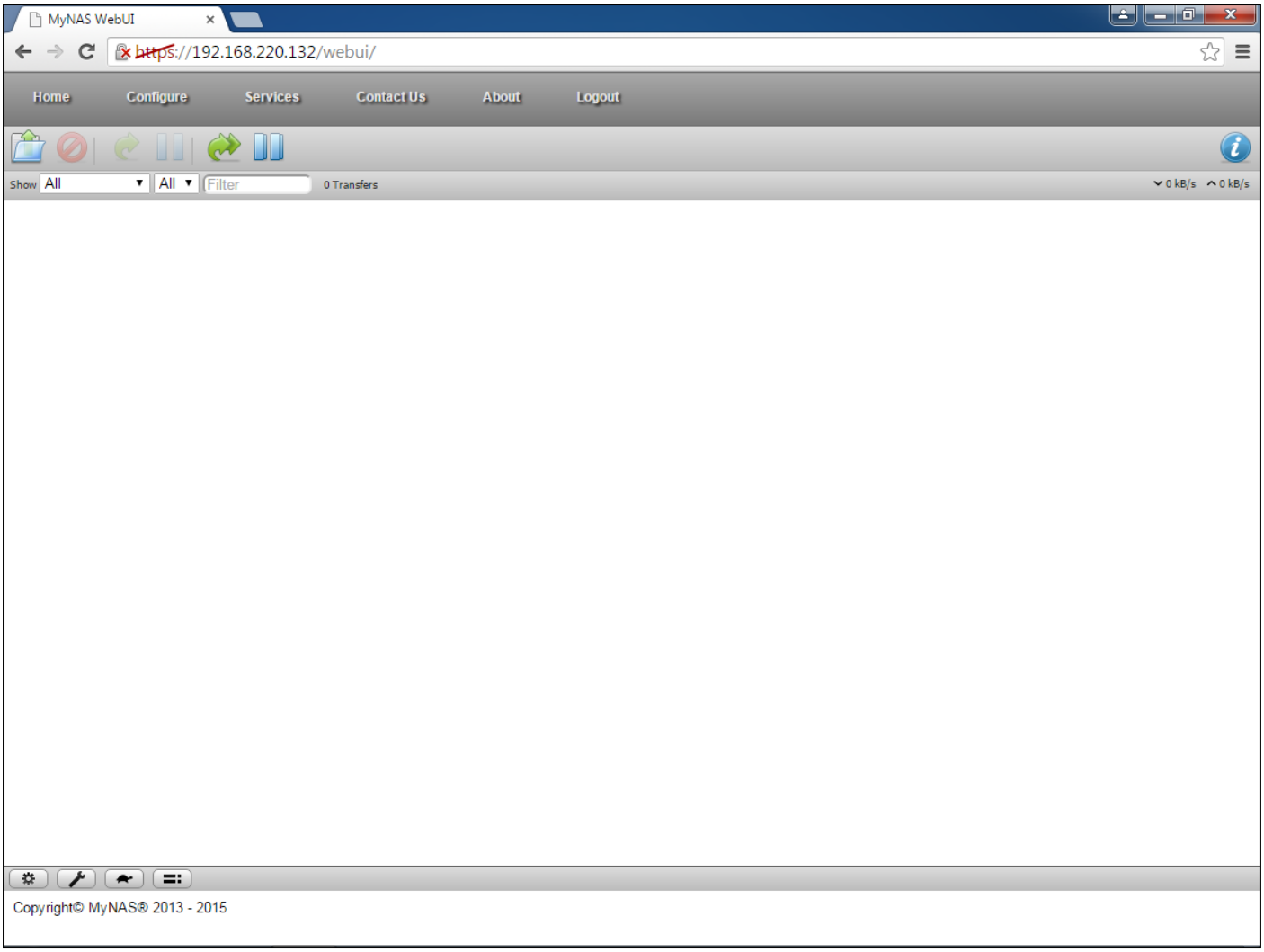
Once the pool where to store the BitTorrent data is selected, click 'Next', then 'Finish' to complete the configuration


MyNAS WebUI
https://192.168.220.132/webui/
Home
Configure
Services
Contact Us
About
Logout
MyNAS Services Configuration
Enable Transmission Client
Transmission BitTorrent Client successfully enabled. Please use the Services Menu to access the BitTorrent Client console.
Finish
Copyright© MyNAS® 2013 - 2015

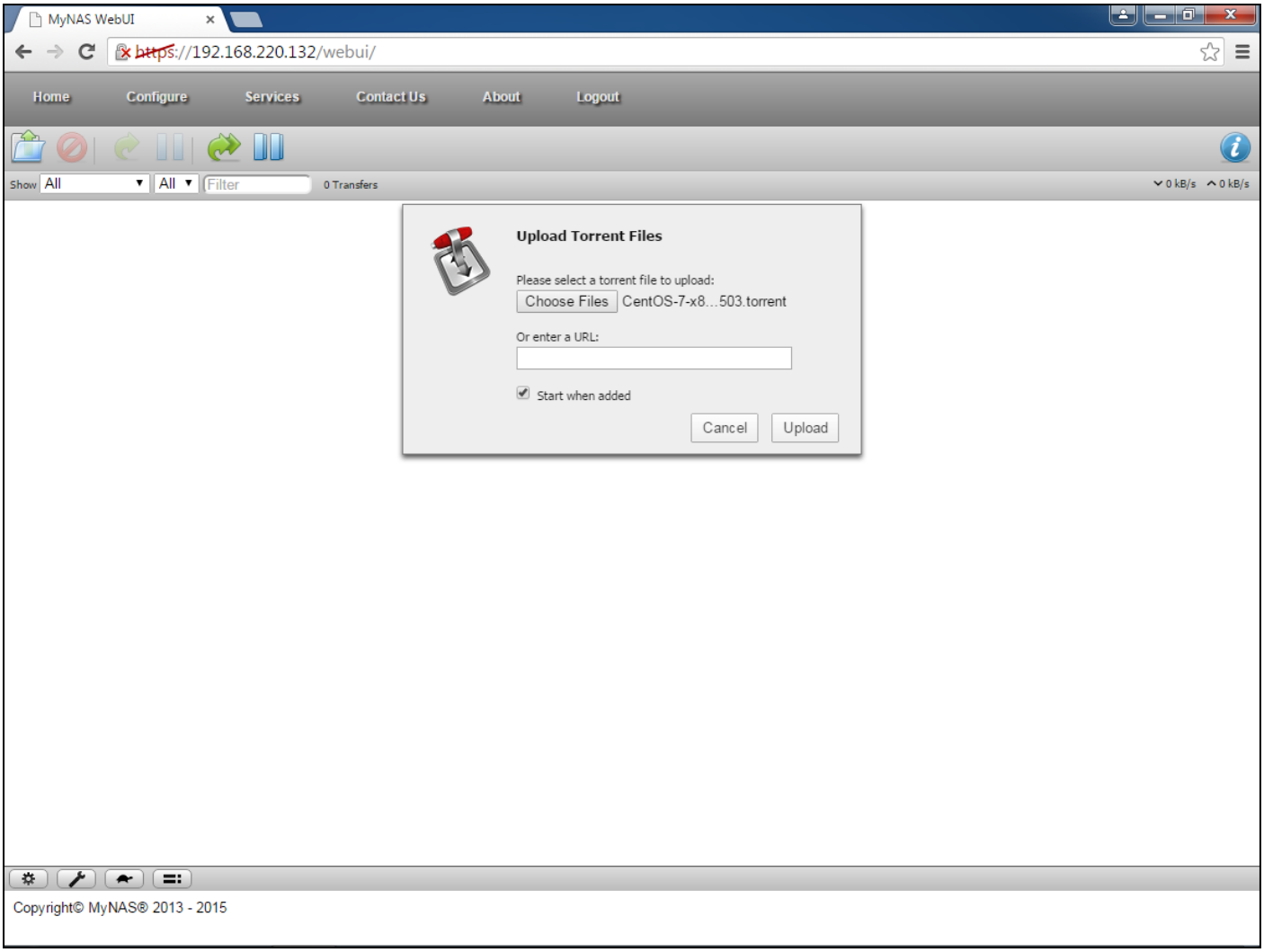
The BitTorrent data repository is also automatically shared out to enable easy access to your downloaded files:



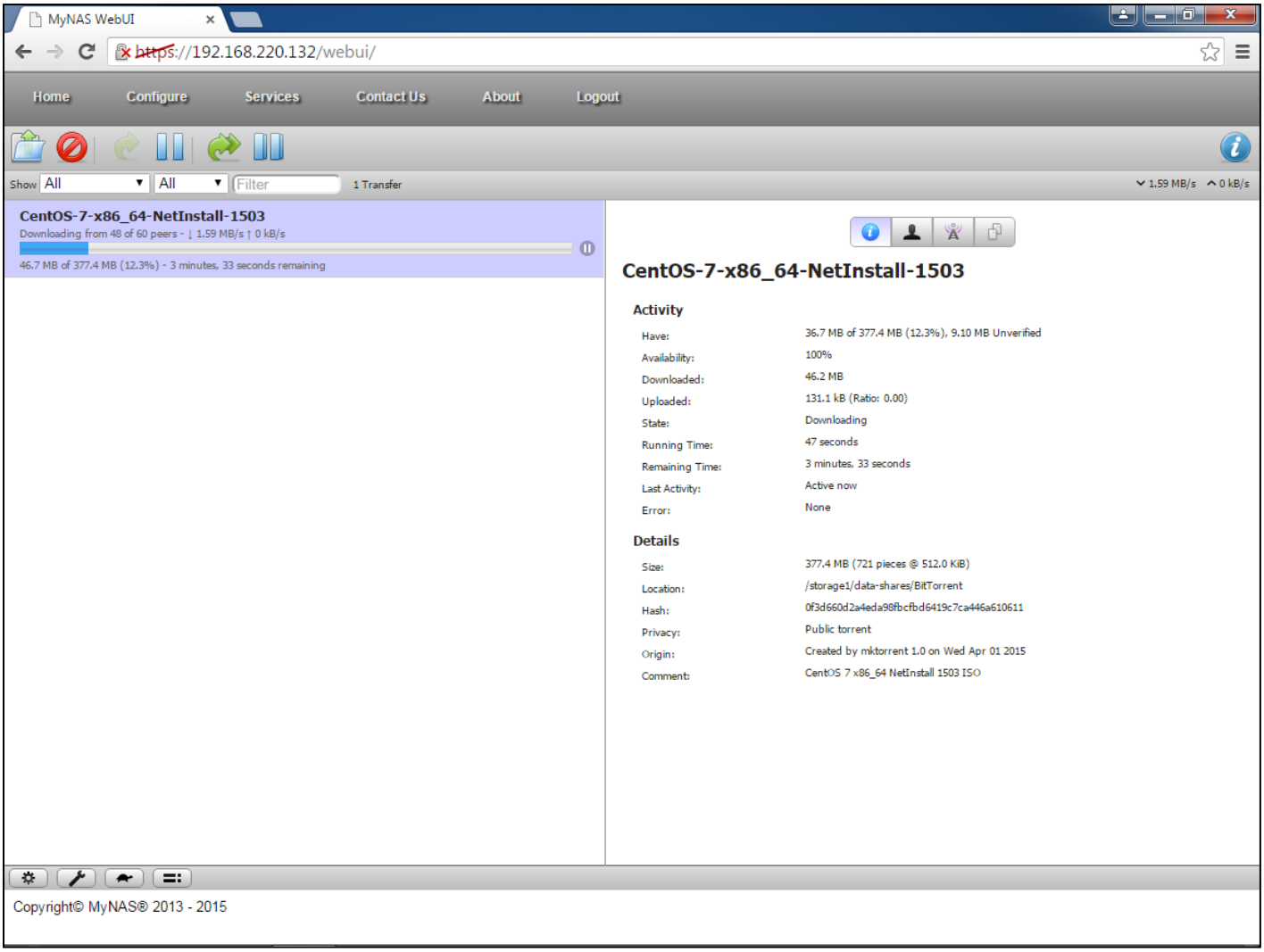
Once Transmission is enabled, click on the 'Services' menu, then 'Transmission' to bring up the fully functional Transmission Client:



To use the BitTorrent client, upload a .torrent file from your local machine:



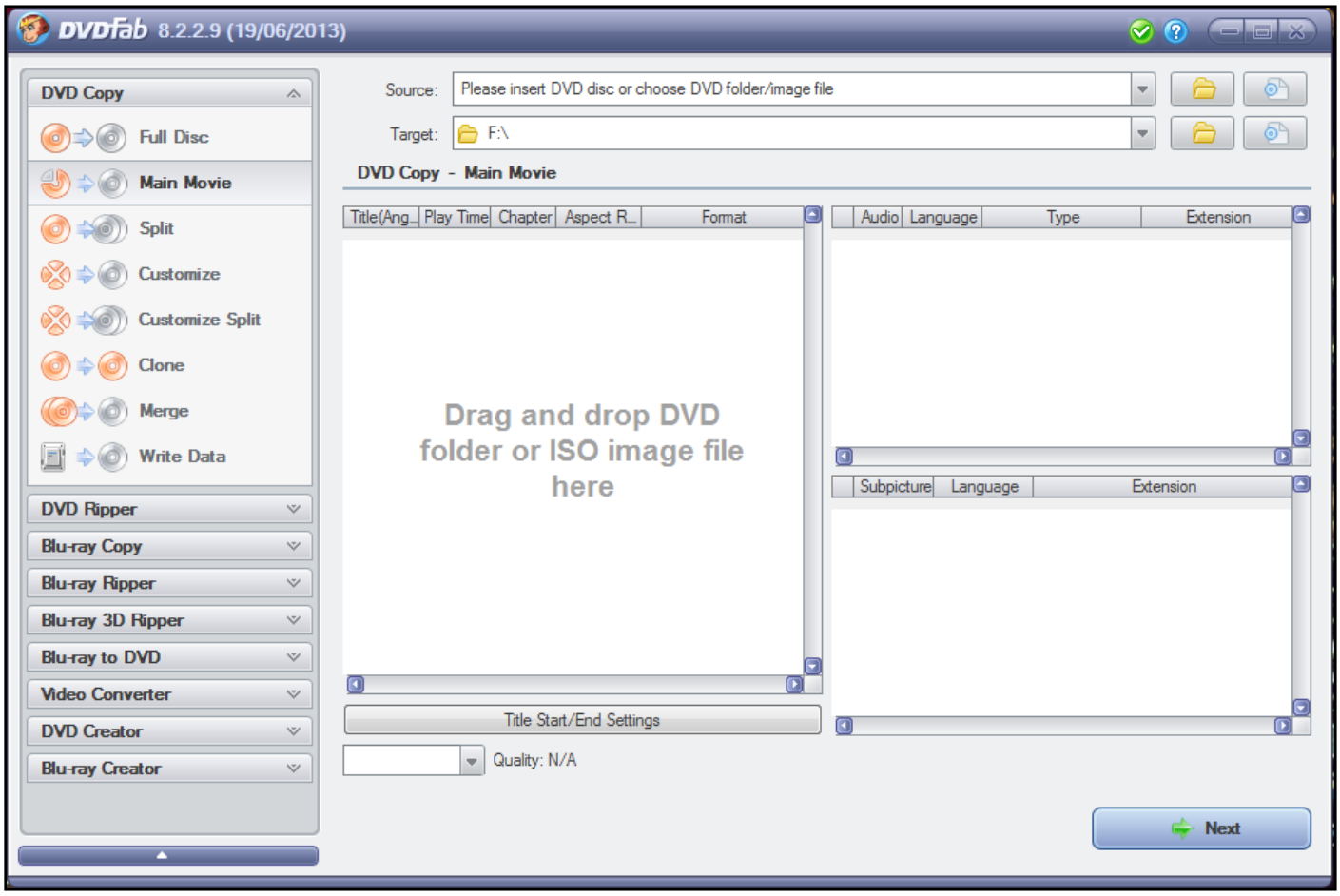
Once uploaded, the torrent will start to download:


MyNAS WebUI
https://192.168.220.132/webui/
Home
Configure
Services
Contact Us
About
Logout
Show All All Filter 1 Transfer
1.59 MB/s 0 kB/s
CentOS-7-x86_64-NetInstall-1503
Downloading from 48 of 60 peers - ↓ 1.59 MB/s ↑ 0 kB/s
46.7 MB of 377.4 MB (12.3%) - 3 minutes, 33 seconds remaining
CentOS-7-x86_64-NetInstall-1503
Activity
Have: 36.7 MB of 377.4 MB (12.3%), 9.10 MB Unverified
Availability: 100%
Downloaded: 46.2 MB
Uploaded: 131.1 kB (Ratio: 0.00)
State: Downloading
Running Time: 47 seconds
Remaining Time: 3 minutes, 33 seconds
Last Activity: Active now
Error: None
Details
Size: 377.4 MB (721 pieces @ 512.0 KiB)
Location: /storage1/data-shares/BitTorrent
Hash: 0f3d660d2a4eda98fbcfbd6419c7ca446a610611
Privacy: Public torrent
Origin: Created by mktorrent 1.0 on Wed Apr 01 2015
Comment: CentOS 7 x86_64 NetInstall 1503 ISO
Copyright© MyNAS® 2013 - 2015

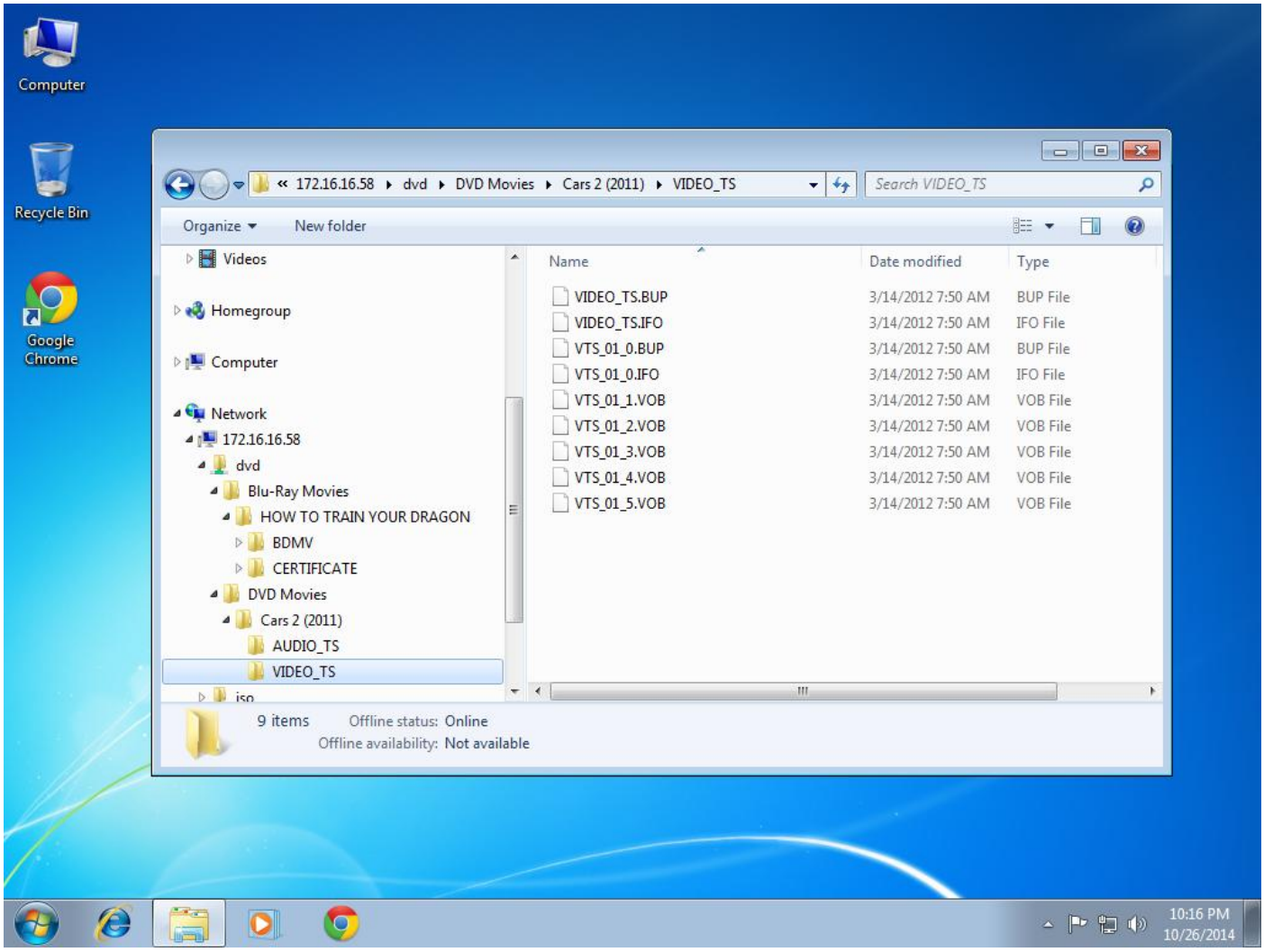
Enable / Disable MiniDLNA

From the WebUI, simply click the appropriate button to Enable / Disable the MiniDLNA Server. Once enabled, you will should be able to view any shared content via network devices that support DLNA. For further information regarding DLNA, refer to http://www.dlna.org/consumer-home

When using DVD backup tools (such as DVDfab), backup the 'Main Movie' to your MyNAS DVD Share that will be shared out via DLNA:

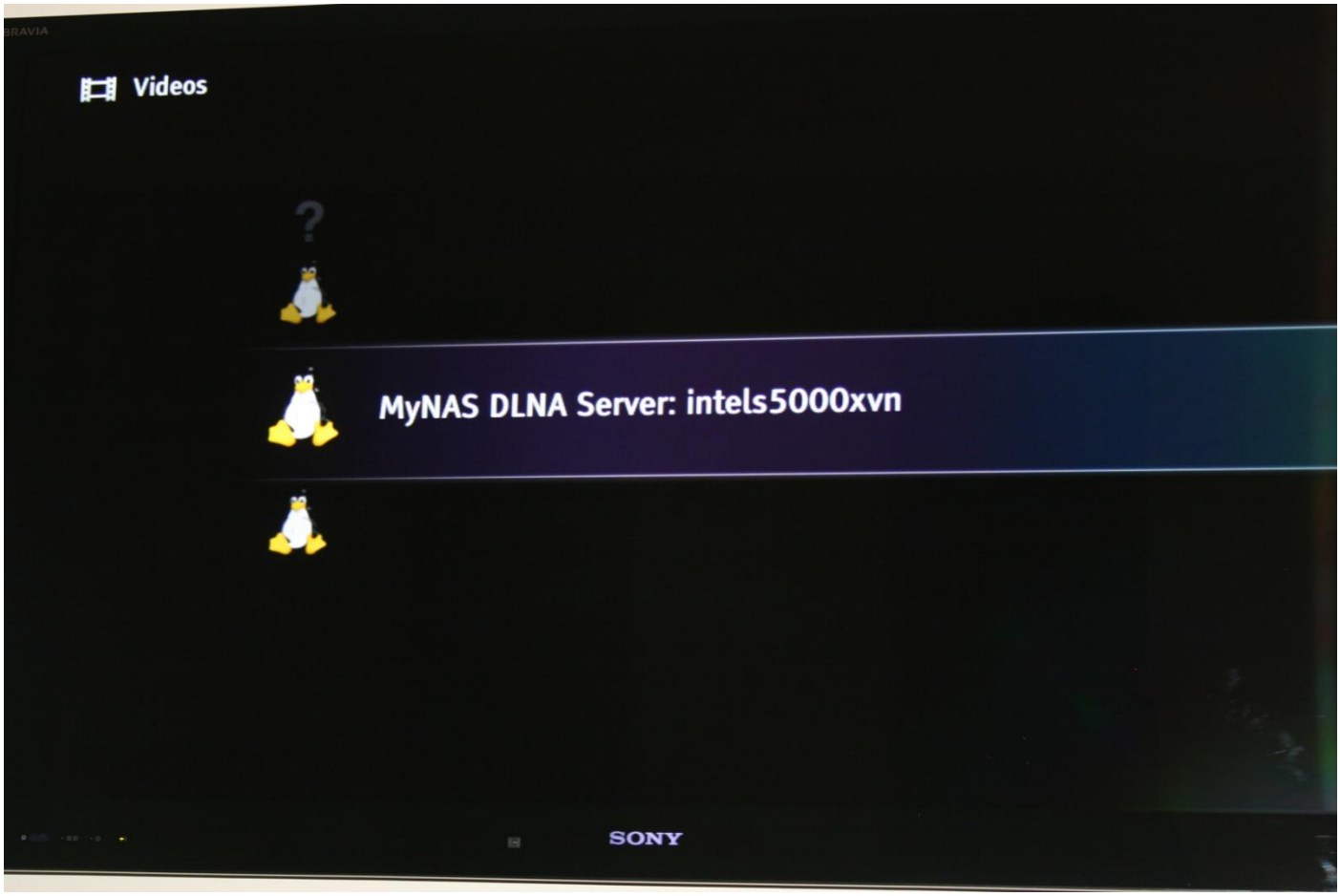


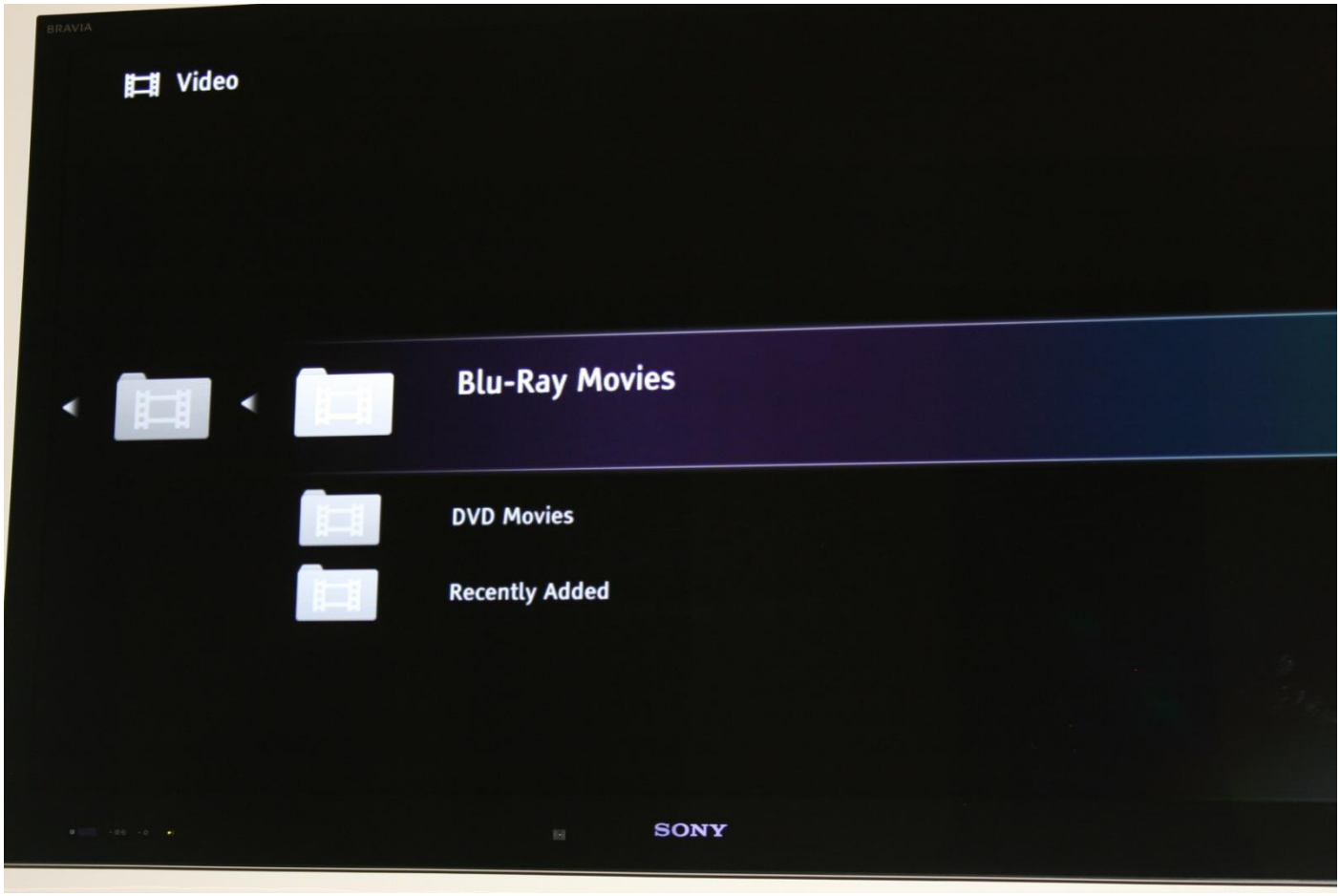
The DLNA Server on MyNAS will take all of the individual DVD VOB and Blu-Ray files and 'automatically' stitch them together to ensure a seamless movie playback from a DLNA device such as a TV:

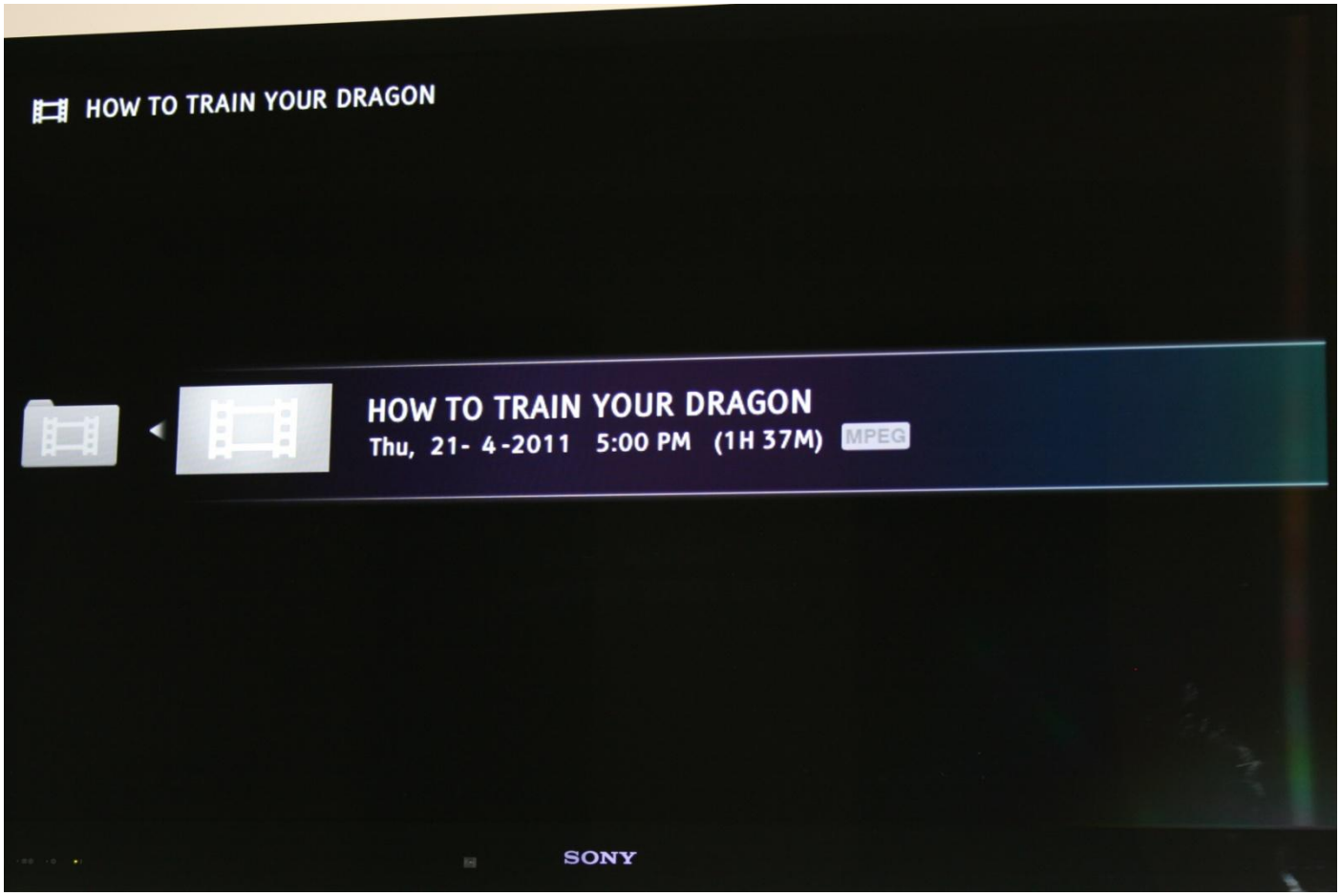


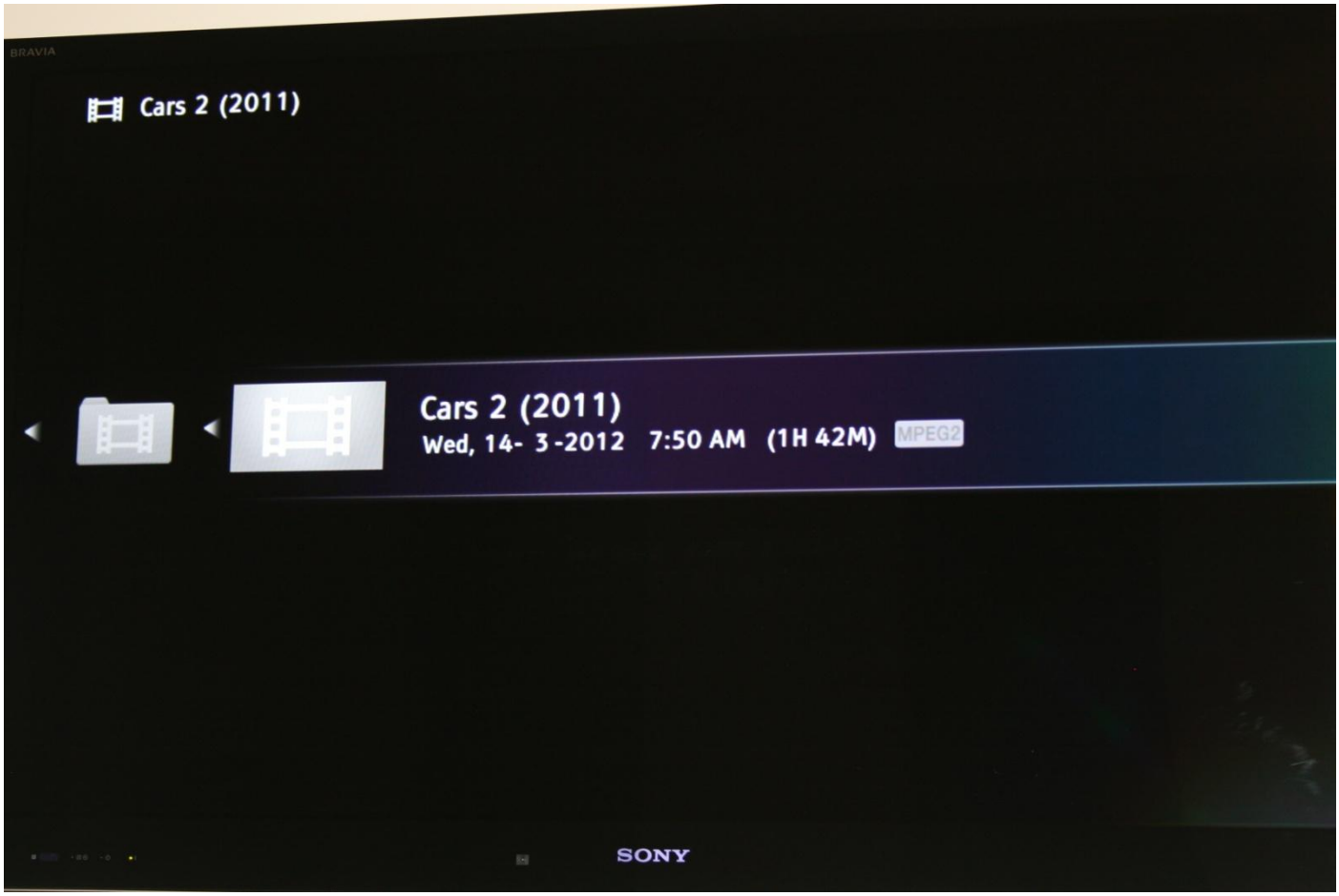
When viewing the DLNA Server on your TV, refer to your TV manual for correct configuration of accessing a network DLNA Server.

The illustrations below detail what is seen via a Sony Bravia TV:


Videos
MyNAS DLNA Server: intels5000xvn
SONY


Video
Blu-Ray Movies
DVD Movies
Recently Added
SONY


HOW TO TRAIN YOUR DRAGON
HOW TO TRAIN YOUR DRAGON
Thu, 21- 4-2011 5:00 PM (1H 37M)
MPEG
SONY


BRAVIA
Cars 2 (2011)
Cars 2 (2011)
Wed, 14- 3-2012 7:50 AM (1H 42M)
MPEG2
SONY

Note: If the DVD / Blu-Ray backup contains DTS Audio, MyNAS will denote that the source has DTS audio by adding [DTS] to the file name. DTS Audio is generally not supported by DLNA devices, thus you may not hear any audio when attempting to watch a DLNA stream that only has DTS audio.

Enable / Disable Kodi (XBMC) Central Database

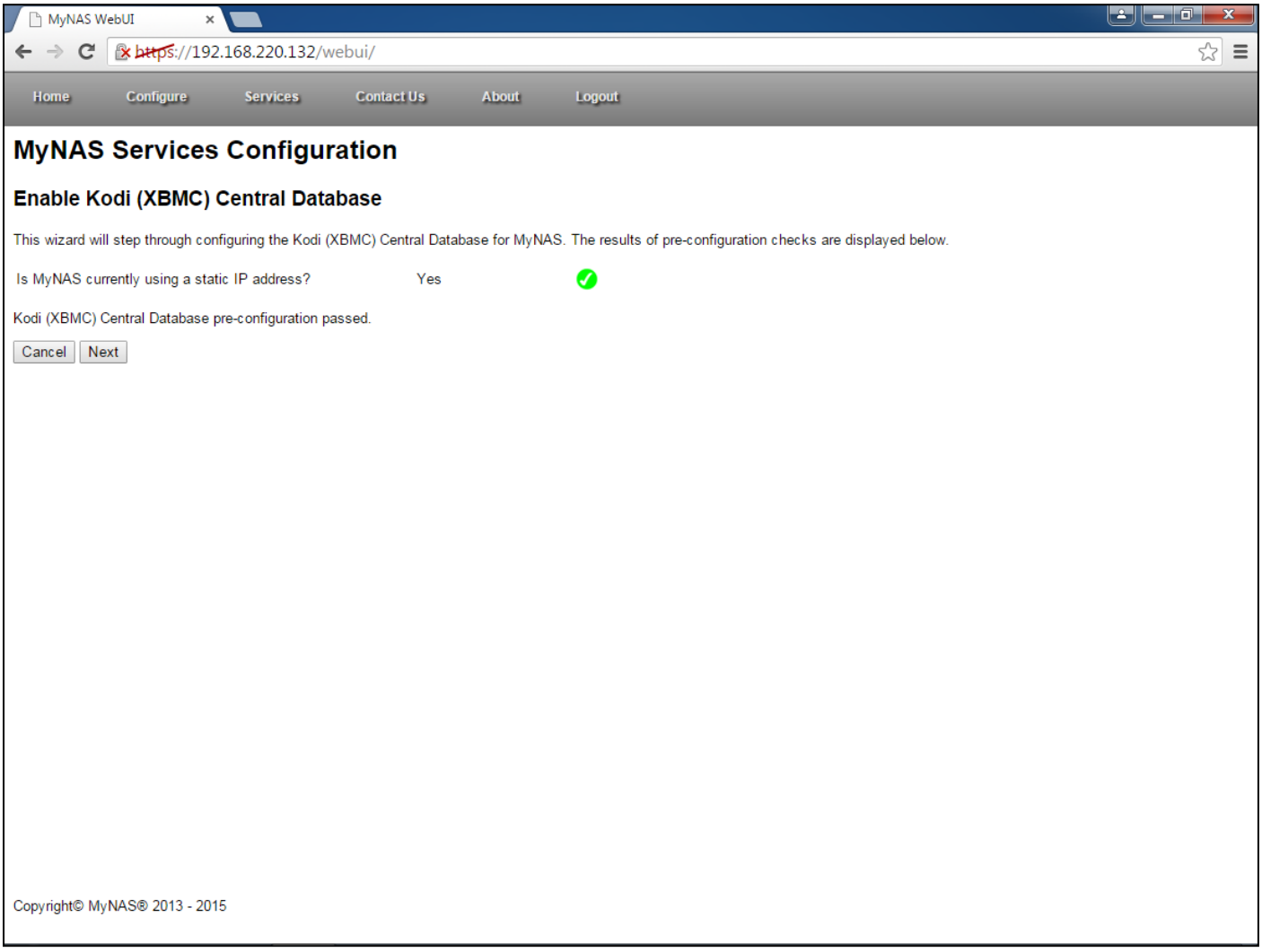
What is Kodi?

Kodi is an award-winning free and open source (GPL) software media player and entertainment hub that can be installed on Linux, OSX, Windows, iOS, and Android, featuring a 10-foot user interface for use with televisions and remote controls. It allows users to play and view most videos, music, podcasts, and other digital media files from local and network storage media and the internet.

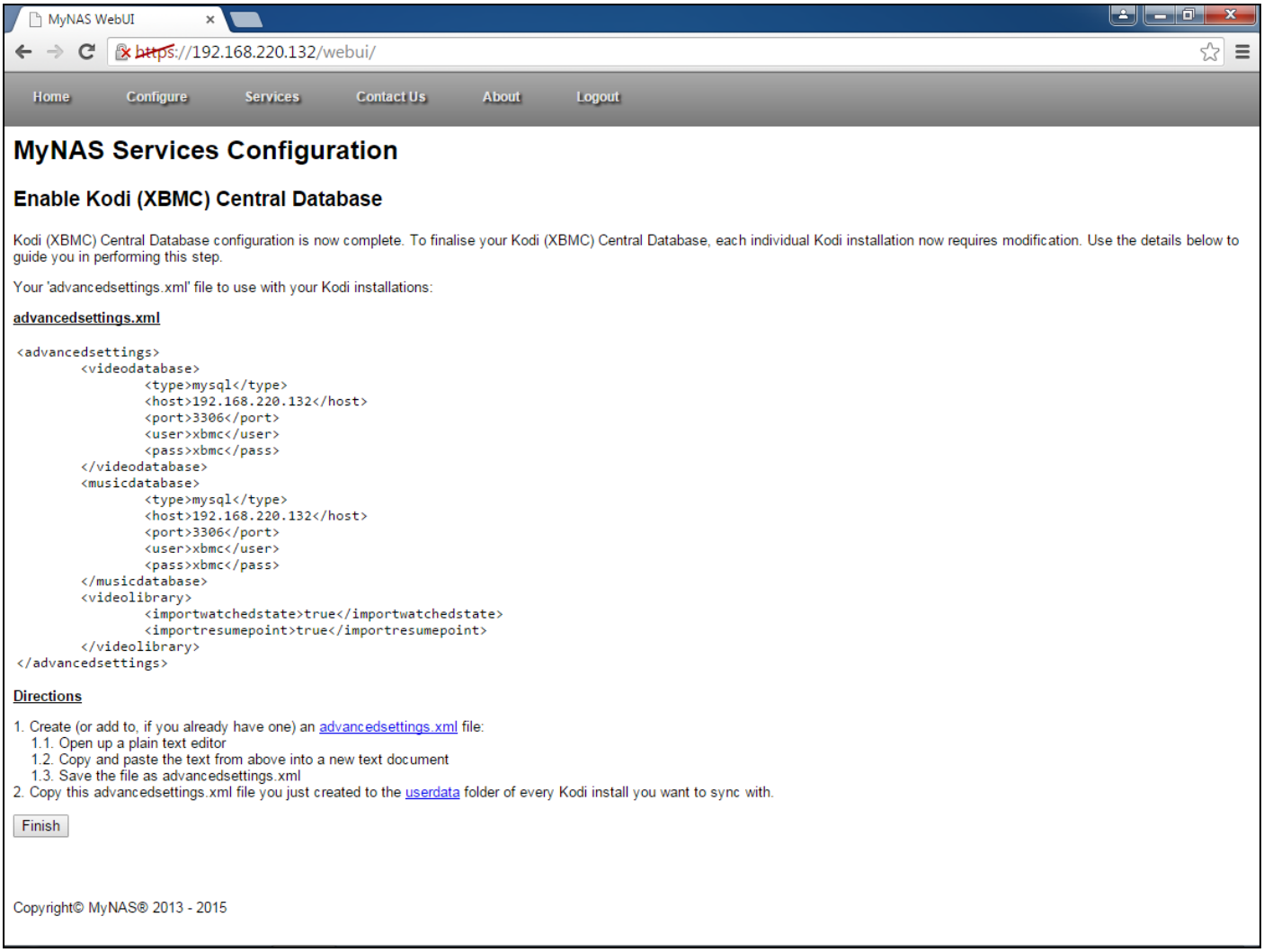
With Kodi installed on many devices, having a central database to manage and share the same content on those devices is simplified.

Enabling the Kodi Central Database

From the WebUI, simply click the appropriate button to Enable / Disable the Kodi Central Database. In order to do this, MyNAS requires a static IP address to be configured as illustrated below:

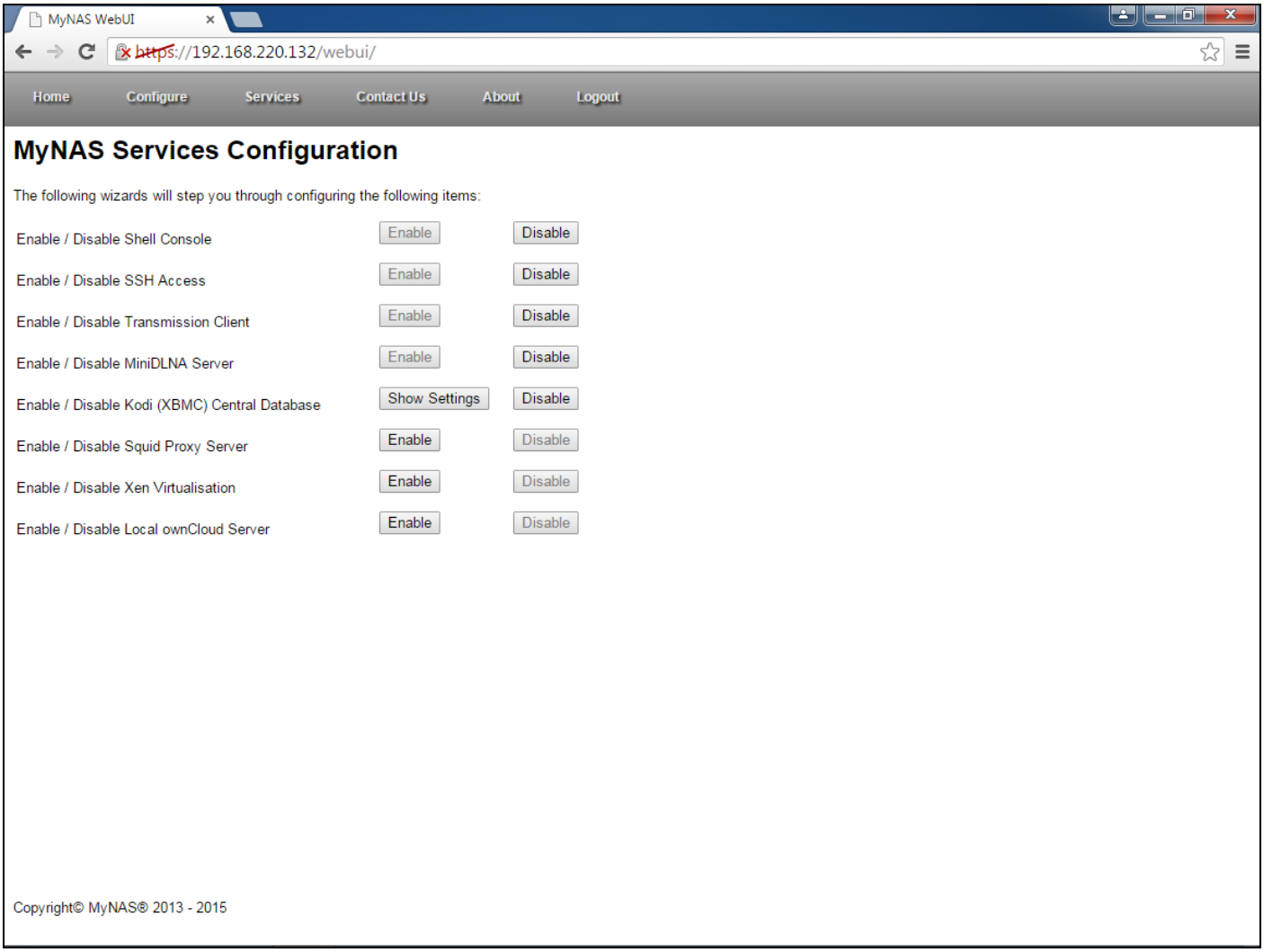


If the pre-configuration check is successful, click 'Next'. The Kodi database configuration will now occur, and will provide you with the required additional configuration items needed to configure your Kodi installation:



Click 'Finish' to complete the setup of the Kodi Central Database.

Note: If you want to view the settings for configuring Kodi at any time, going back into the MyNAS Services Configuration displays the following:



Clicking on the 'Show Settings' button will display the configuration which you need for your client configuration.

Enable / Disable Squid Proxy Server

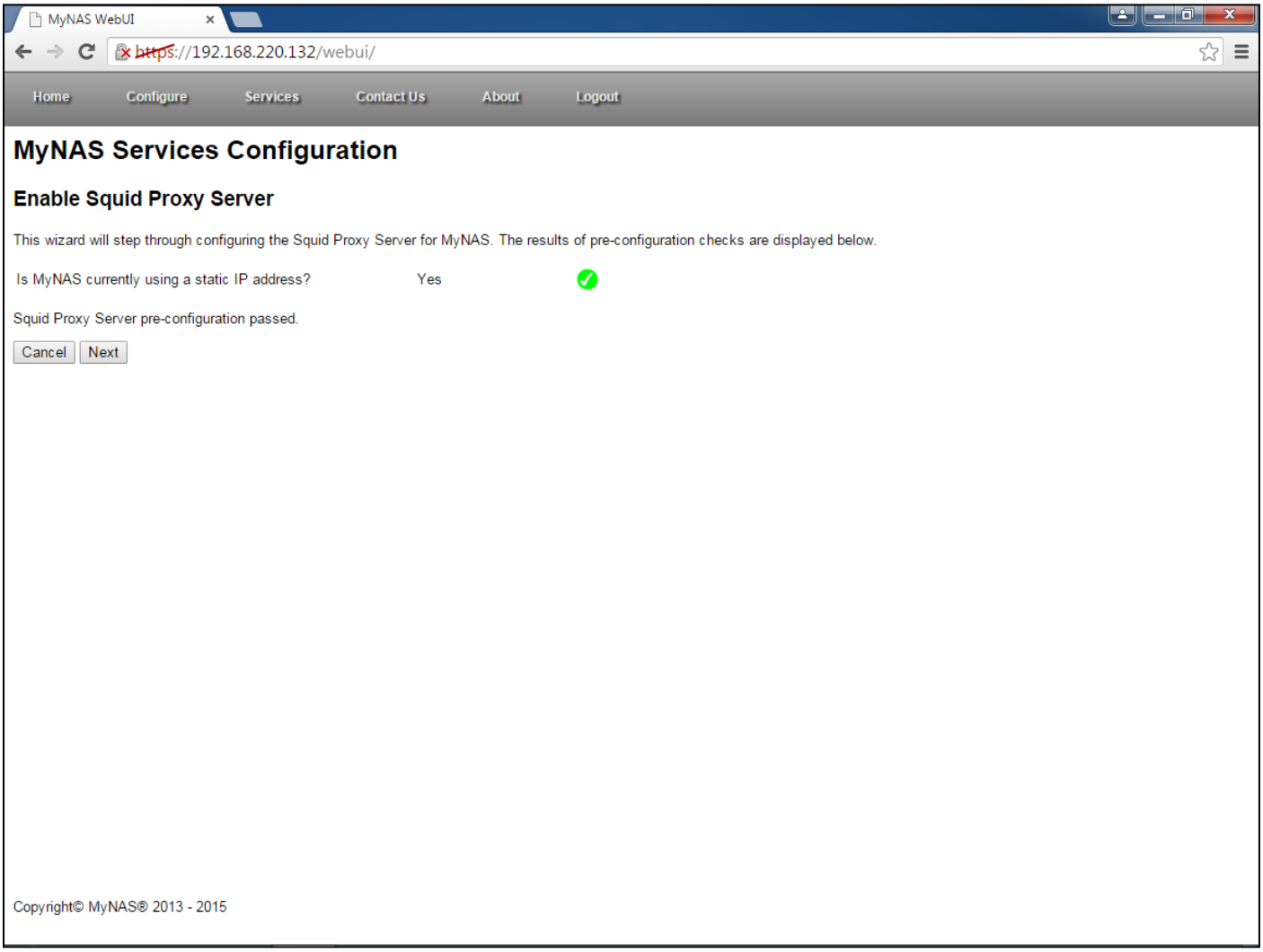
What is Squid Proxy Server?

Squid is a caching proxy for the Web supporting HTTP, HTTPS, FTP, and more. It reduces bandwidth and improves response times by caching and reusing frequently-requested web pages.

Squid is used by hundreds of Internet Providers world-wide to provide their users with the best possible web access. Squid optimises the data flow between client and server to improve performance and caches frequently-used content to save bandwidth. Squid can also route content requests to servers in a wide variety of ways to build cache server hierarchies which optimise network throughput. By utilising Squid Proxy Server in your environment you are implementing a way to improve your Internet experience.

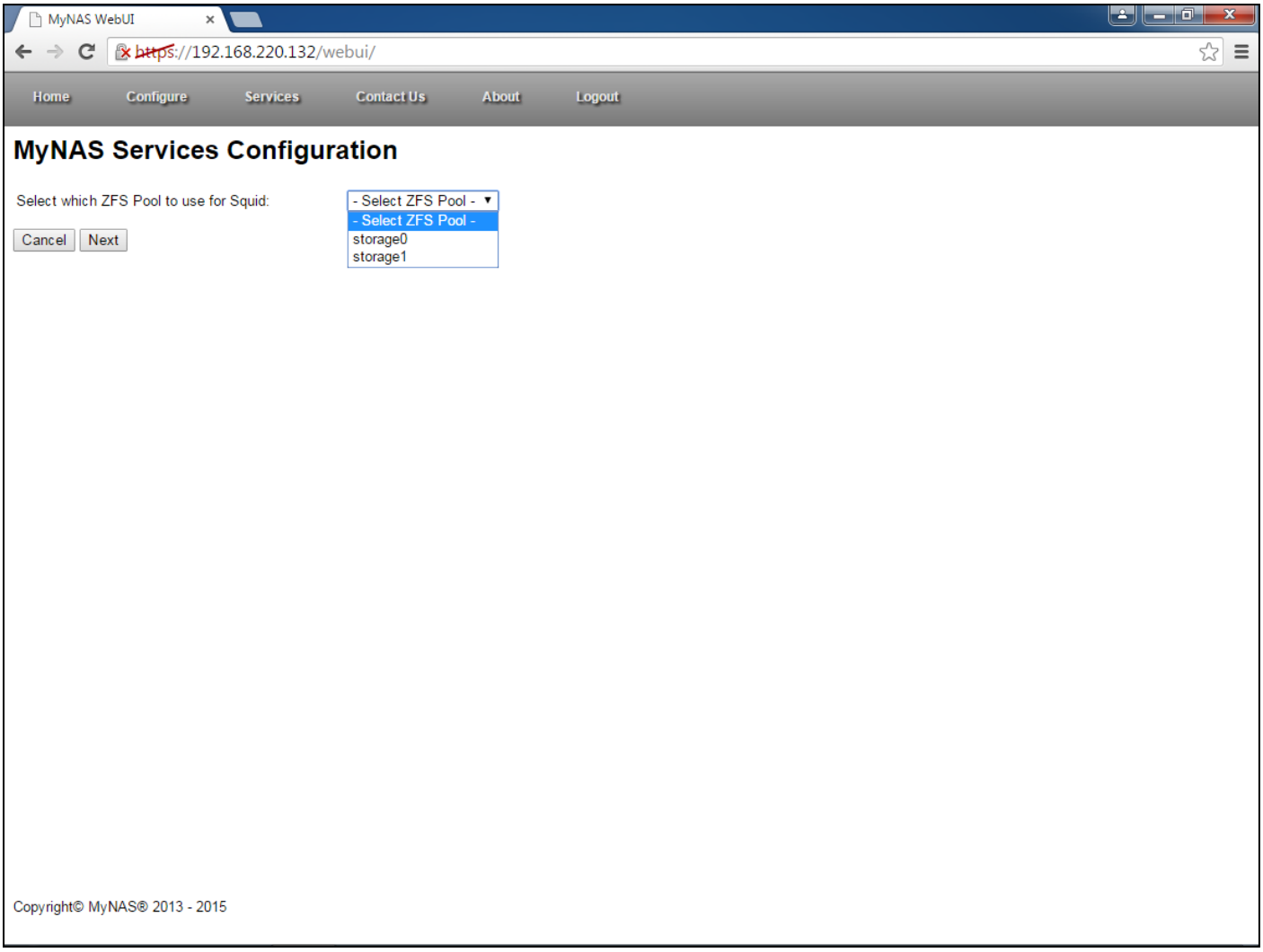
Enabling Squid Proxy Server

From the WebUI, simply click the appropriate button to Enable / Disable the Squid Proxy Server. In order to do this, MyNAS requires a static IP address to be configured as illustrated below:



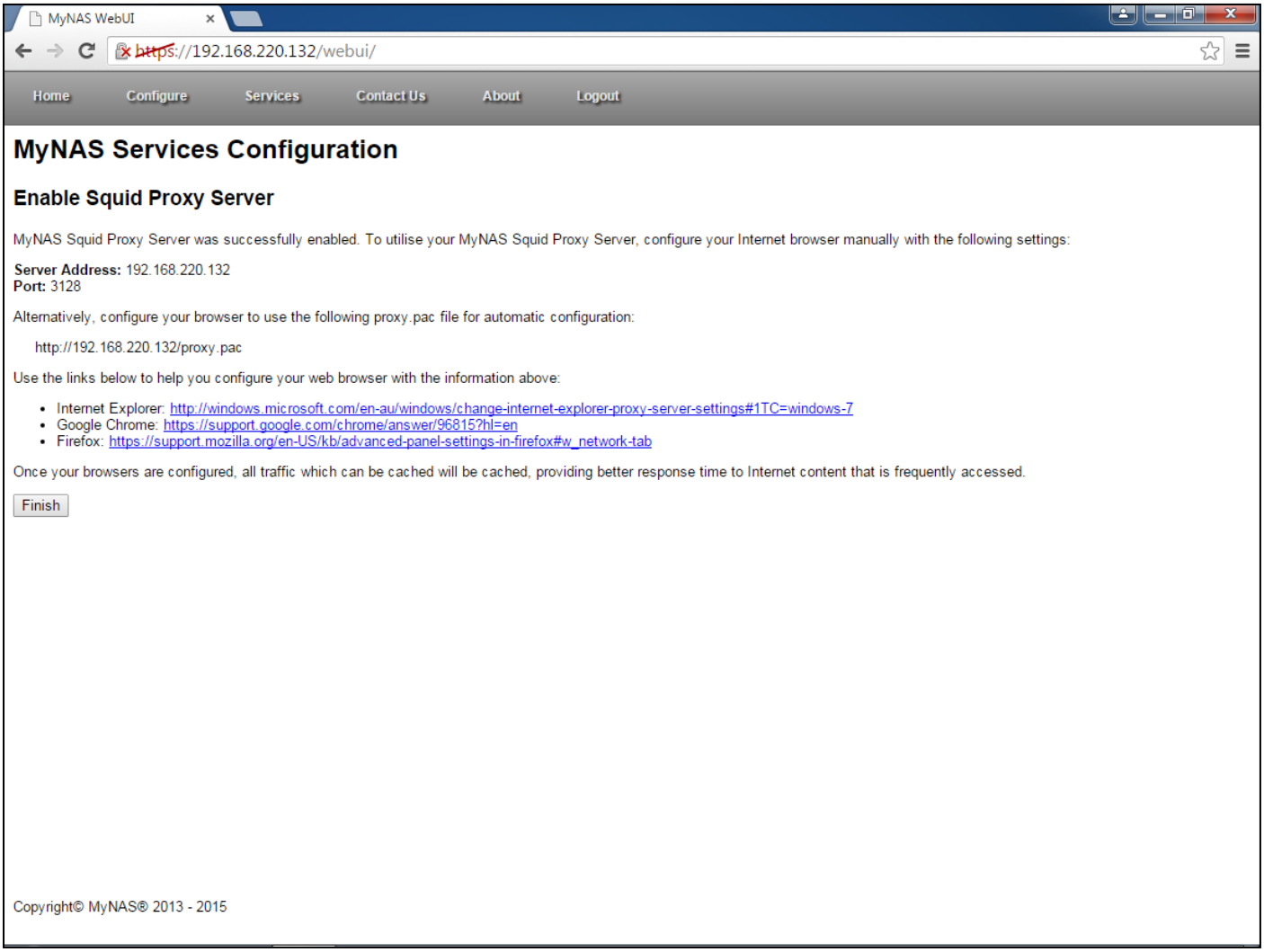
If the pre-configuration check is successful, click 'Next'.

Depending on the ZFS Pool configuration, if there are more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for the Squid Proxy data:



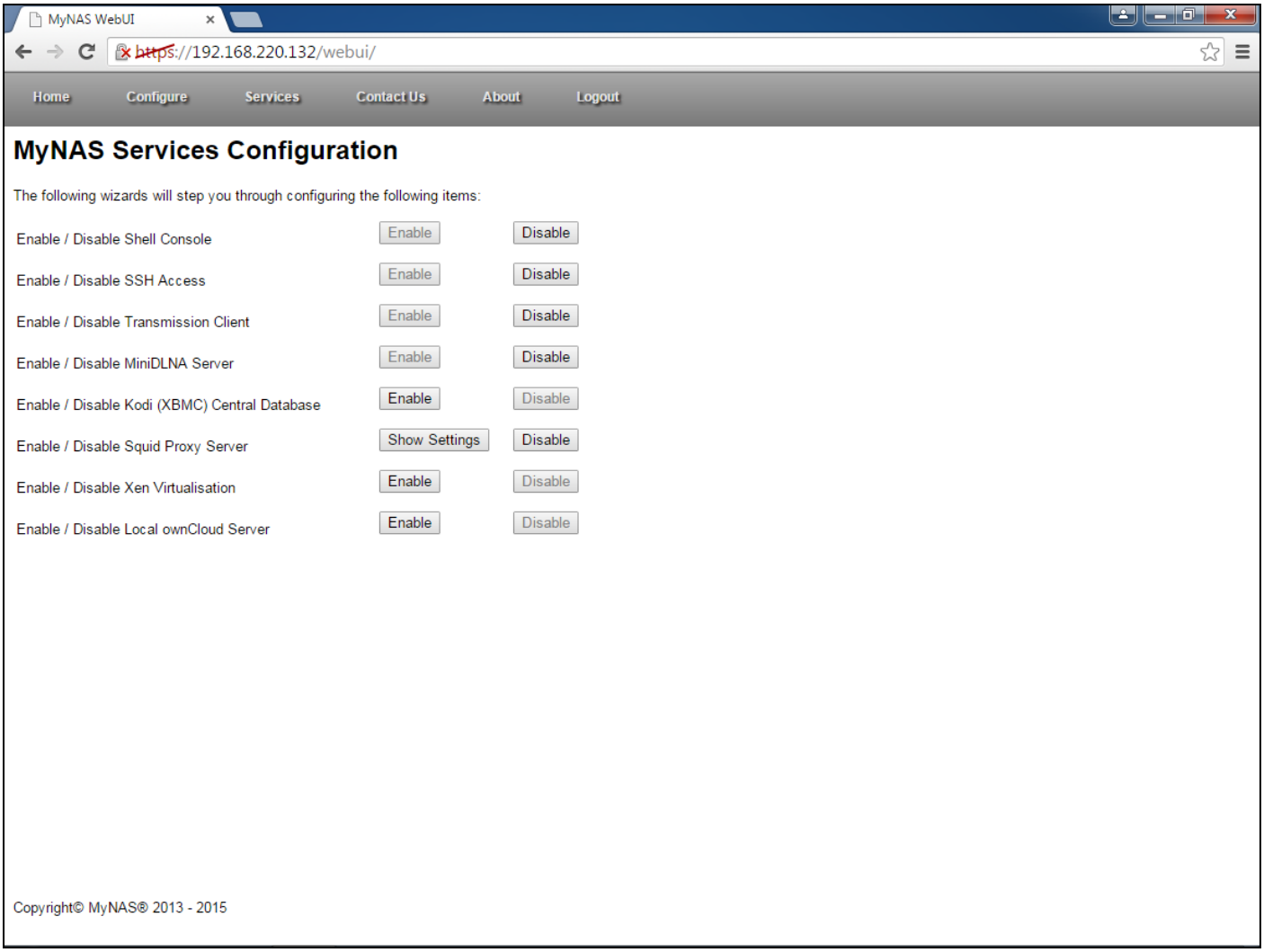
Once the pool where to store the Squid Proxy data is selected, click 'Next' to finalise the Squid proxy configuration.

MyNAS will display what configuration to use for your clients on your network to utilise the Squid proxy server:



Click 'Finish' to complete the configuration.

Note: If you want to view the settings for configuring web browser clients to use Squid at any time, going back into the MyNAS Services Configuration displays the following:



Clicking on the 'Show Settings' button will display the configuration which you need for your client configuration.

Enable / Disable Xen Virtualisation

What is Xen Virtualisation?

The Xen Project community develops an open-source type-1 or baremetal hypervisor, which makes it possible to run many instances of an operating system or indeed different operating systems in parallel on a single machine (or host). The project develops the only type-1 hypervisor that is available as open source. The hypervisor is used as the basis for a number of different commercial and open source applications, such as: server virtualization, Infrastructure as a Service (IaaS), desktop virtualization, security applications, embedded and hardware appliances. It enables users to increase server utilization, consolidate server farms, reduce complexity, and decrease total cost of ownership.

MyNAS includes this functionality to extend the capabilities of your investment in a NAS device.

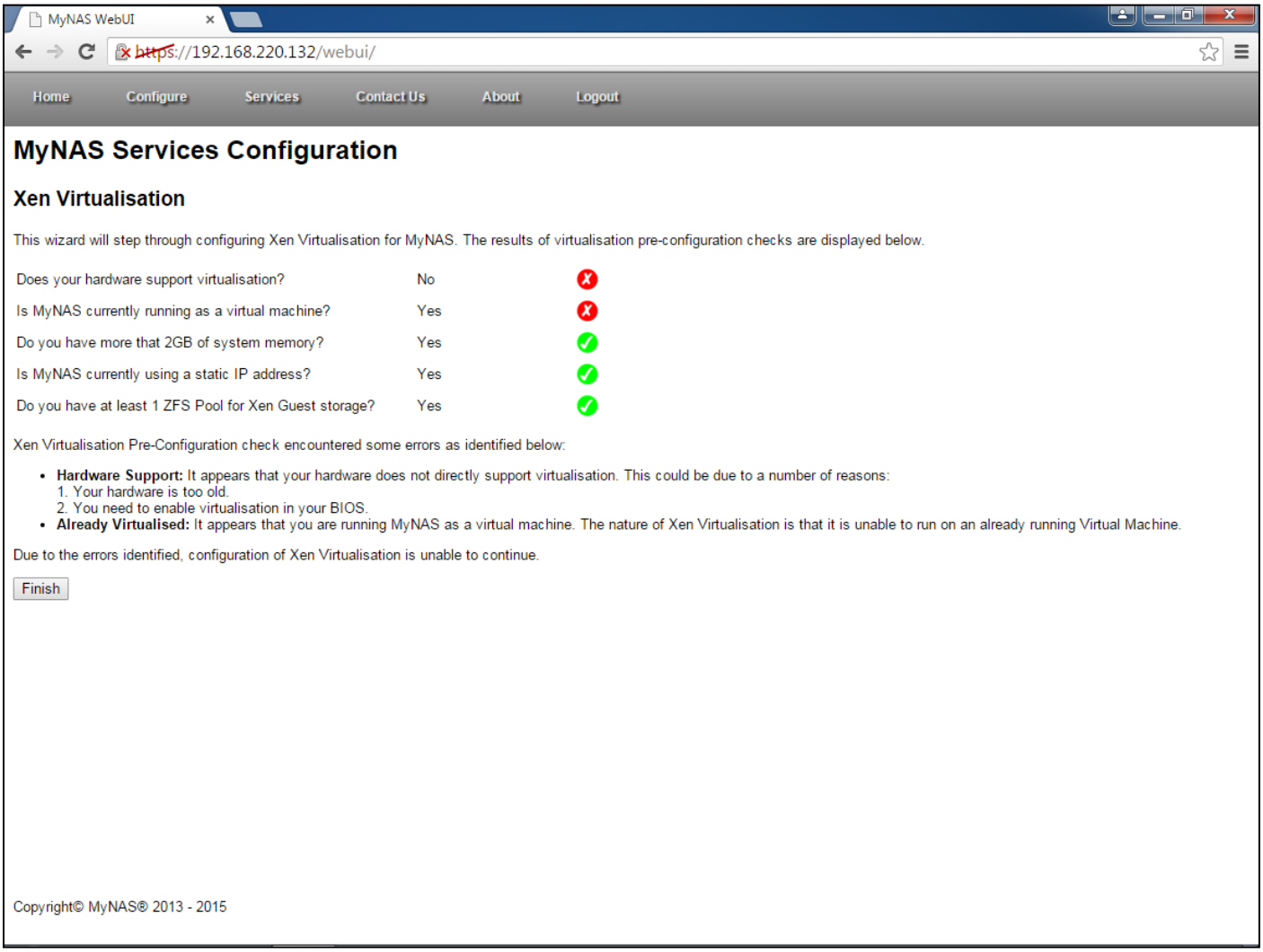
For further information on Xen Virtualisation, refer to http://www.xenproject.org/

To view the virtual machine desktops, Java SE version 7 is required. To download Java SE version 7, visit http://www.oracle.com/technetwork/java/javase/downloads/index.html

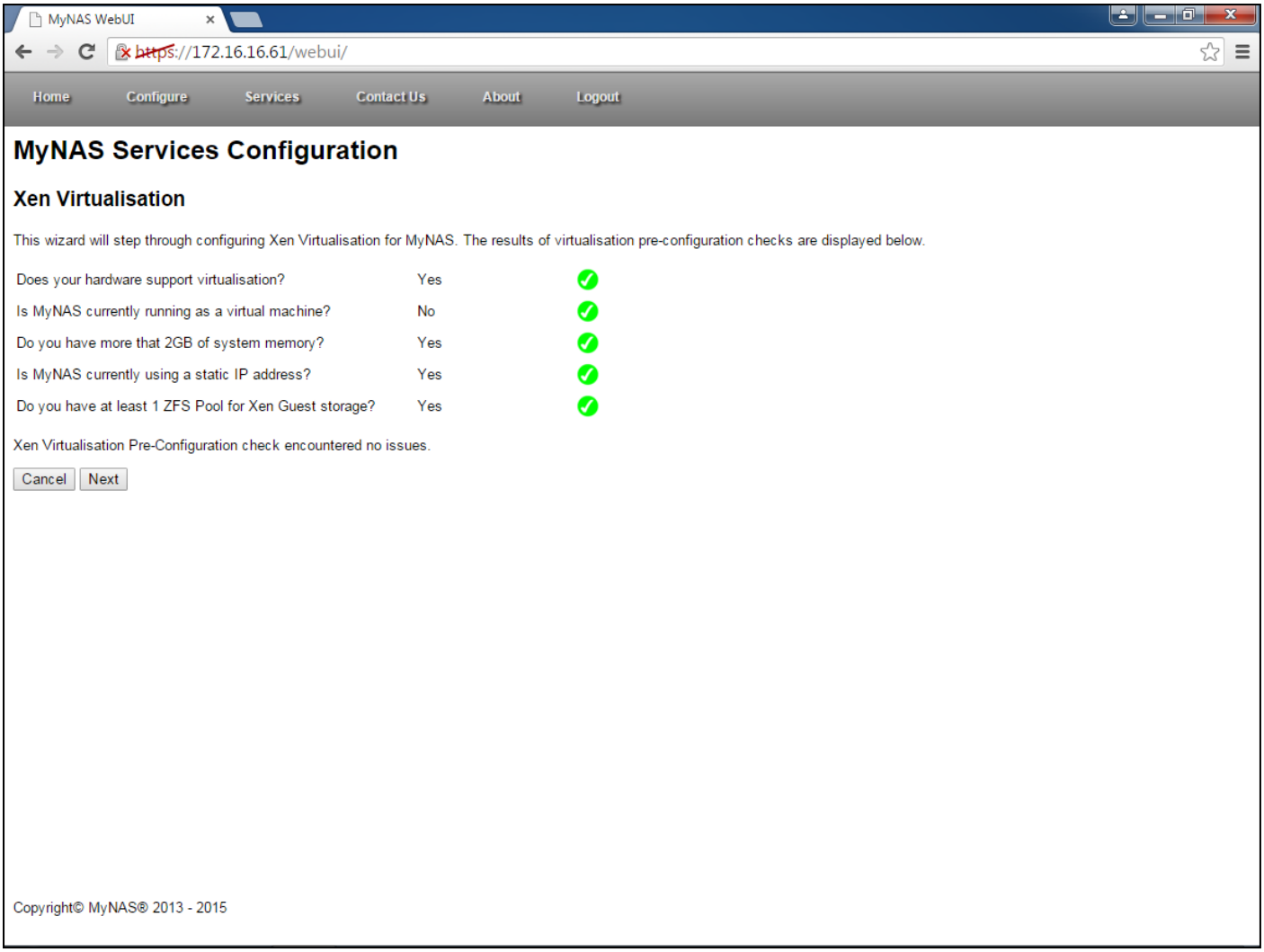
Note: The Java viewer for Xen is currently incompatible with Java SE version 8, however a solution is being worked on for this version of Java.

Enabling Xen Virtualisation

From the WebUI, simply click the appropriate button to Enable / Disable Xen Virtualisation. In order to do this, MyNAS will run through a number of pre-configuration checks:

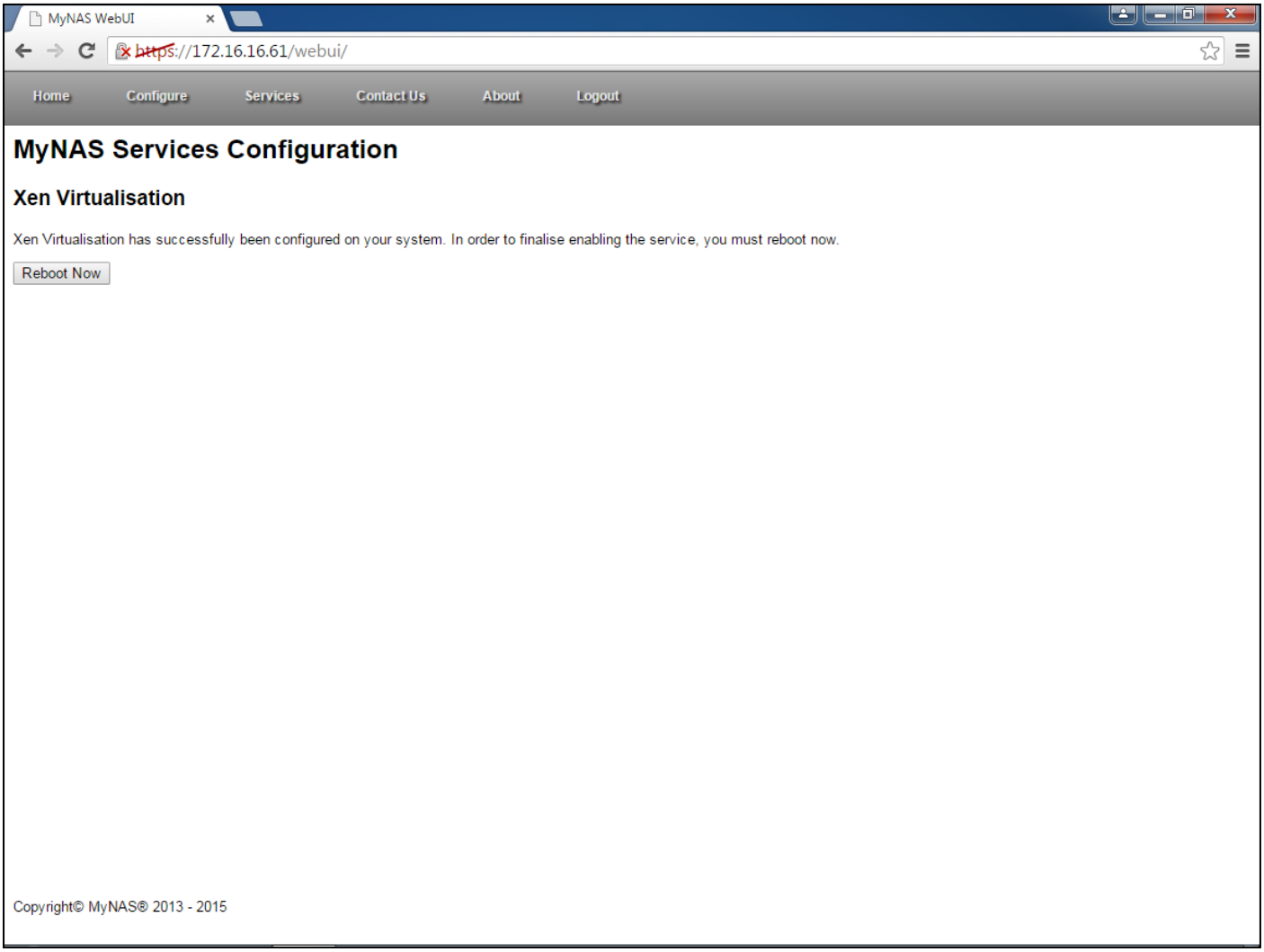


In order to proceed with enabling Xen Virtualisation, all pre-configuration checks need to be successful.



Once all pre-configuration checks are complete and successful, click 'Next'.

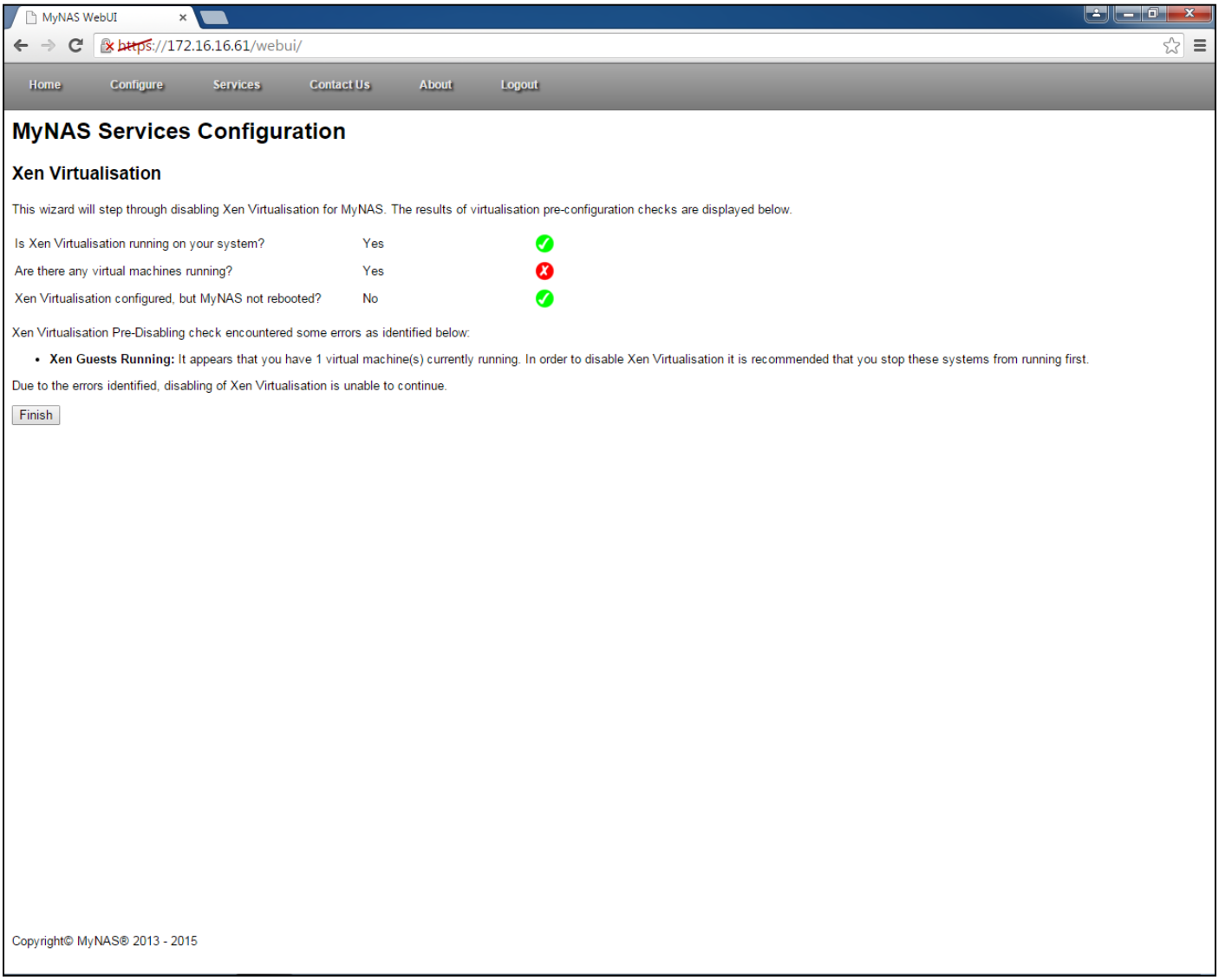
Virtualisation will now be configured on your system.



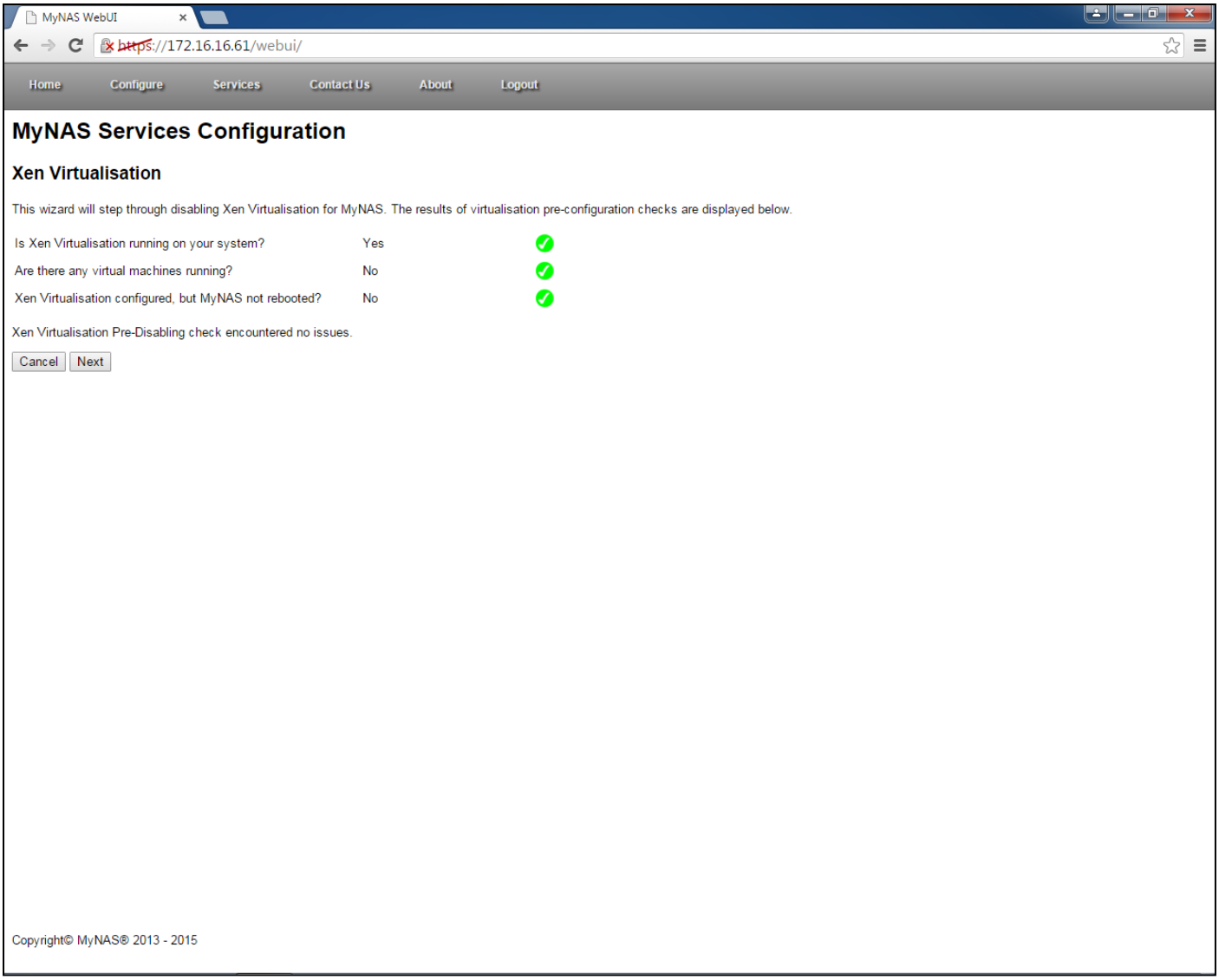
Once the configuration is complete you will need to reboot MyNAS to finalise the enabling of Xen Virtualisation.

Disabling Xen Virtualisation

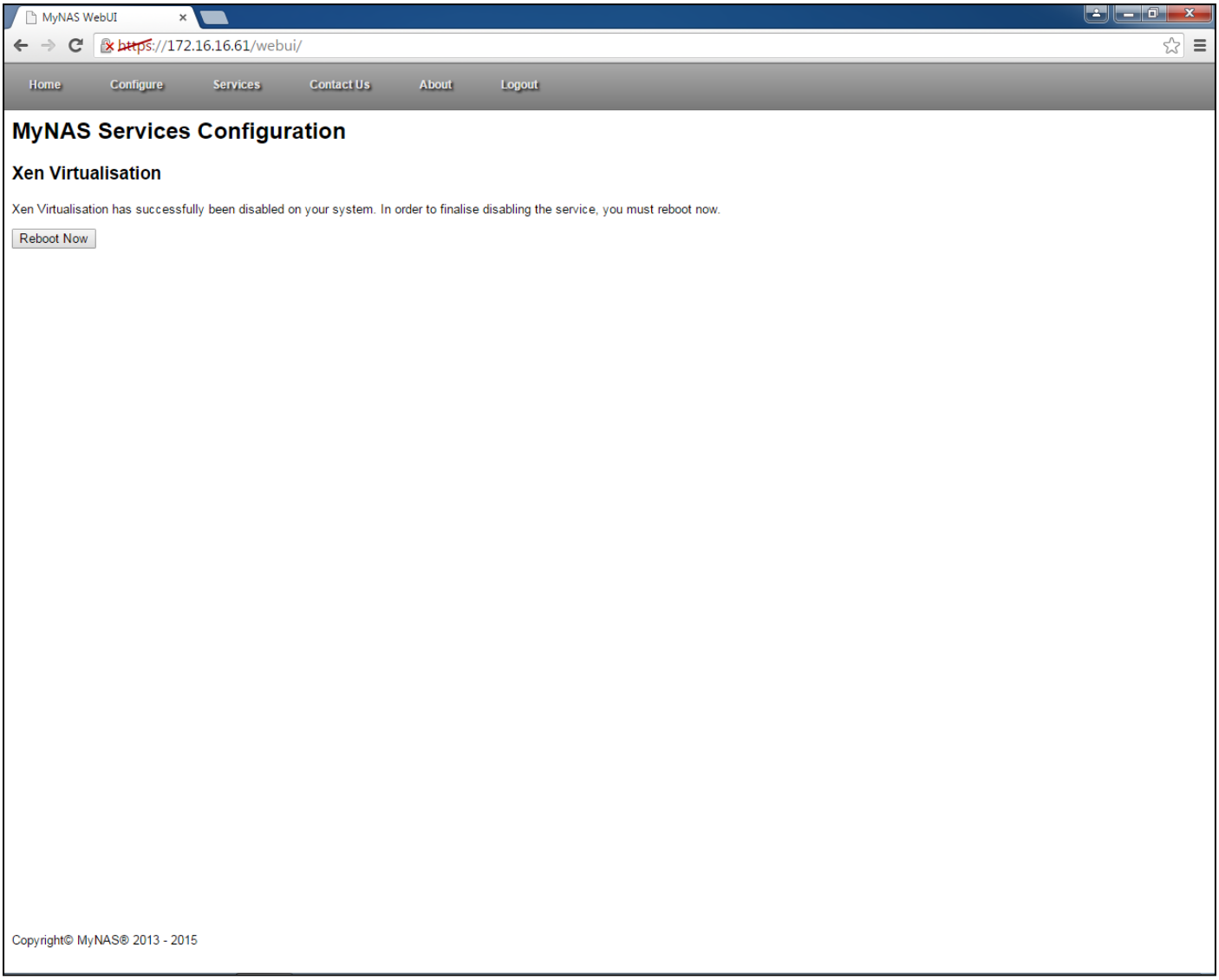
From the WebUI, simply click the appropriate button to Enable / Disable Xen Virtualisation. In order to do this, MyNAS will run through a number of pre-configuration checks:



In order to proceed with disabling Xen Virtualisation, all pre-configuration checks need to be successful.



Once all pre-configuration checks are complete and successful, click 'Next'.



Once the configuration is complete you will need to reboot MyNAS to finalise the disabling of Xen Virtualisation.

Enable / Disable Local ownCloud Server

What is ownCloud?

ownCloud is a self-hosted file sync and share server. It provides access to your data through a web interface, sync clients or WebDAV while providing a platform to view, sync and share across devices easily—all under your control. ownCloud's open architecture is extensible via a simple but powerful API for applications and plugins and it works with any storage.

You can share one or more files and folders on your computer, and synchronize them with your ownCloud server. Place files in your local shared directories, and those files are immediately synchronized to the server and to other devices using the ownCloud Desktop Sync Client, Android app, or iOS app.

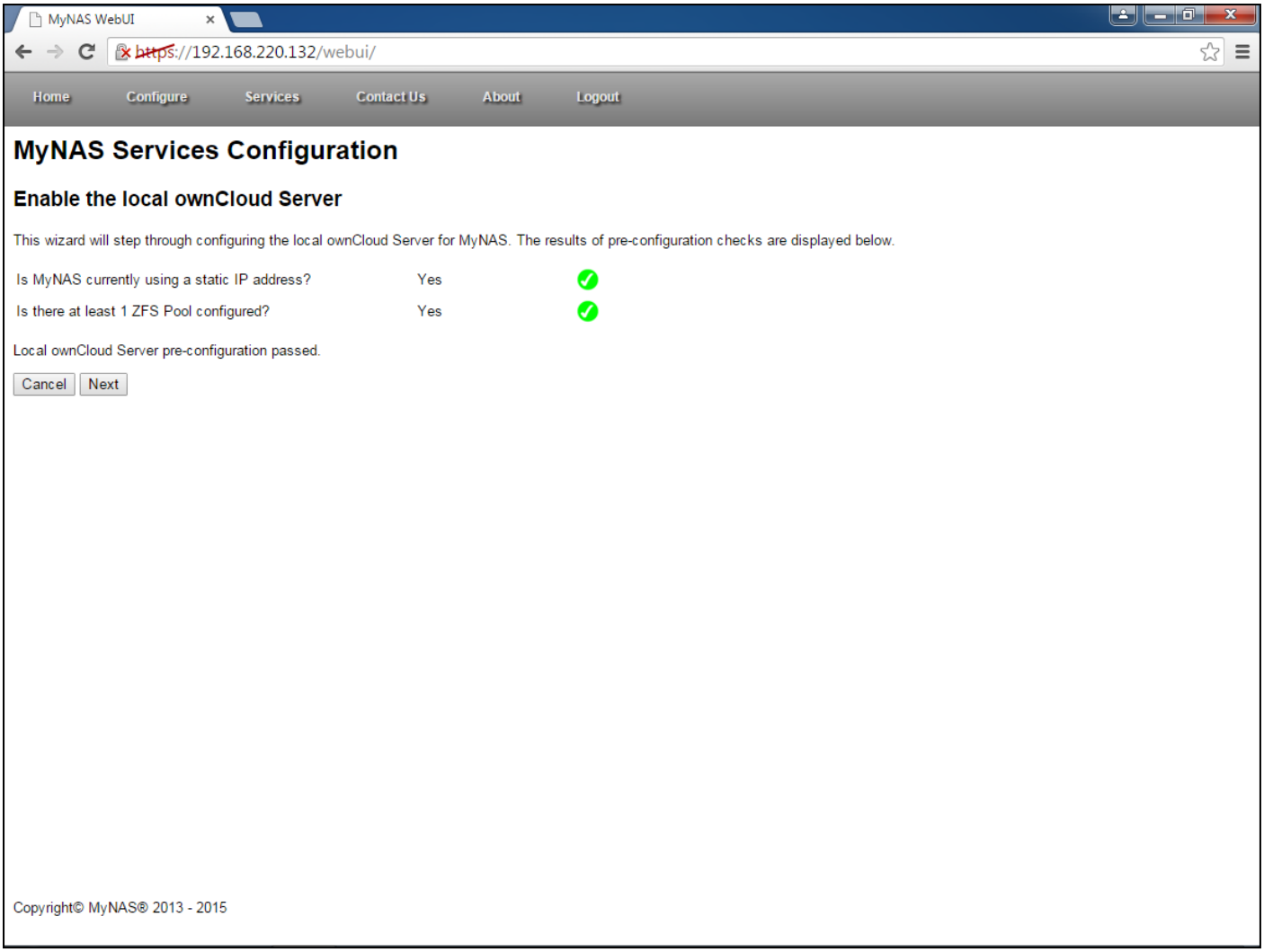
ownCloud is integrated into MyNAS so that:

- Your important files are stored on a ZFS file system for file integrity
- You can share these files out to your mobile devices or sync between devices using the ownCloud clients

For further details regarding ownCloud, visit: https://owncloud.org/

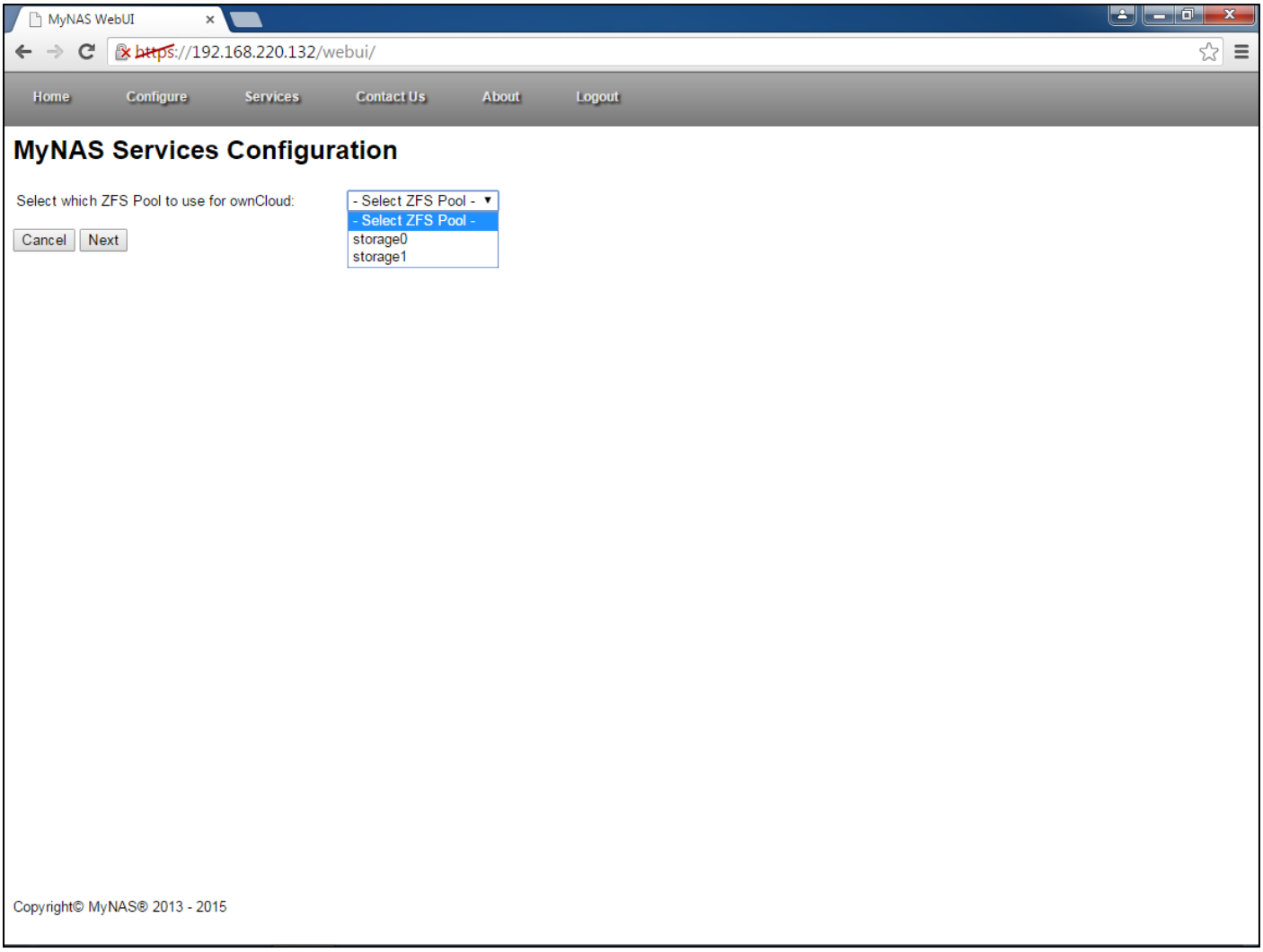
Enabling the local ownCloud Server

From the WebUI, select the Services Configuration menu and simply click the appropriate button to Enable / Disable Local ownCloud Server. In order to do this, MyNAS will run through a number of pre-configuration checks:



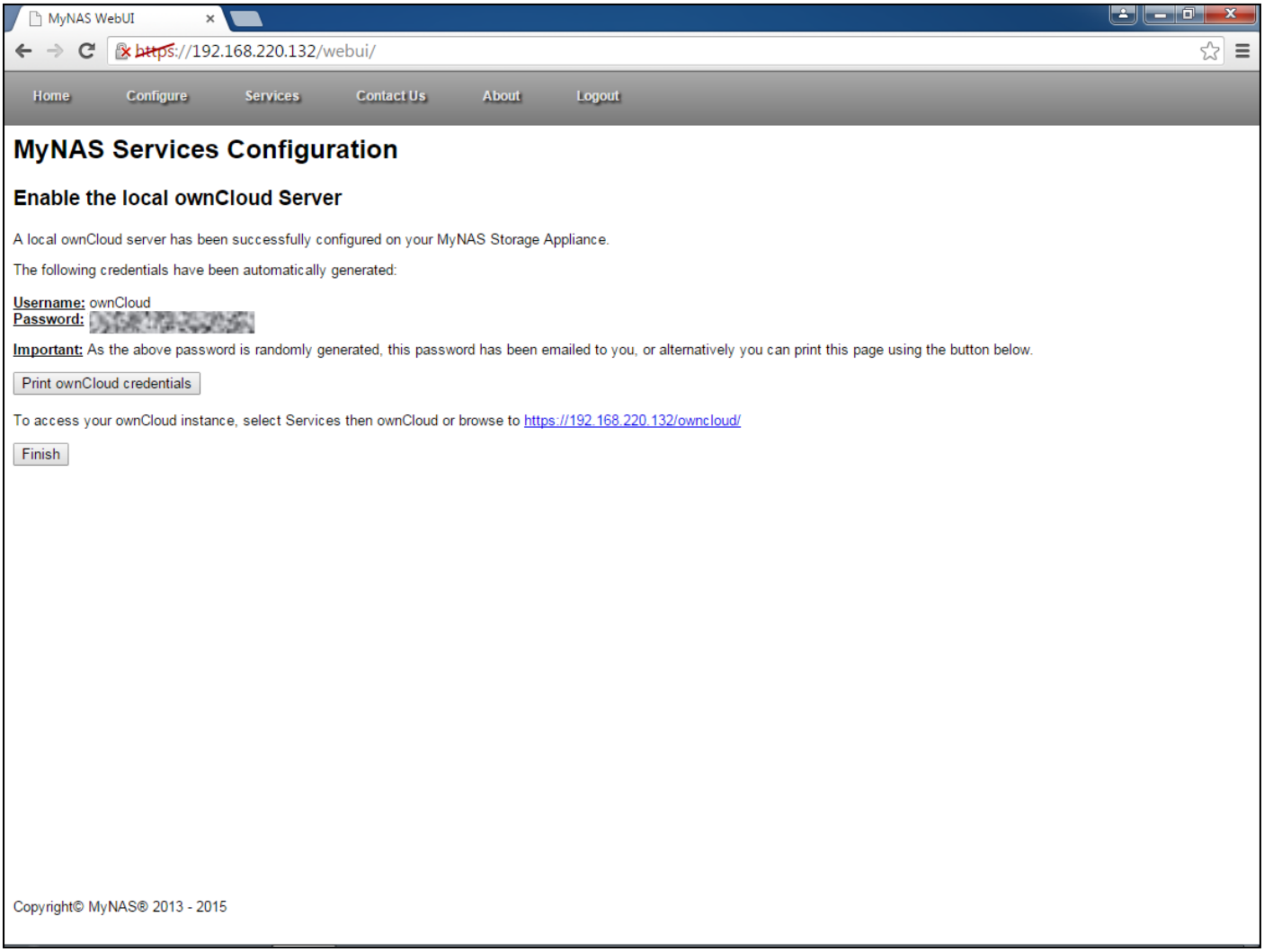
If the pre-checks are all OK, click 'Next' to continue.

Depending on the ZFS Pool configuration, if there are more than 1 ZFS Pool configured, MyNAS will ask which ZFS Pool should be used for the base ownCloud data:



Select the applicable storage pool to use for ownCloud and click 'Next'. MyNAS will now configure ownCloud on your MyNAS Storage Appliance.

Once configured, the following will be displayed:

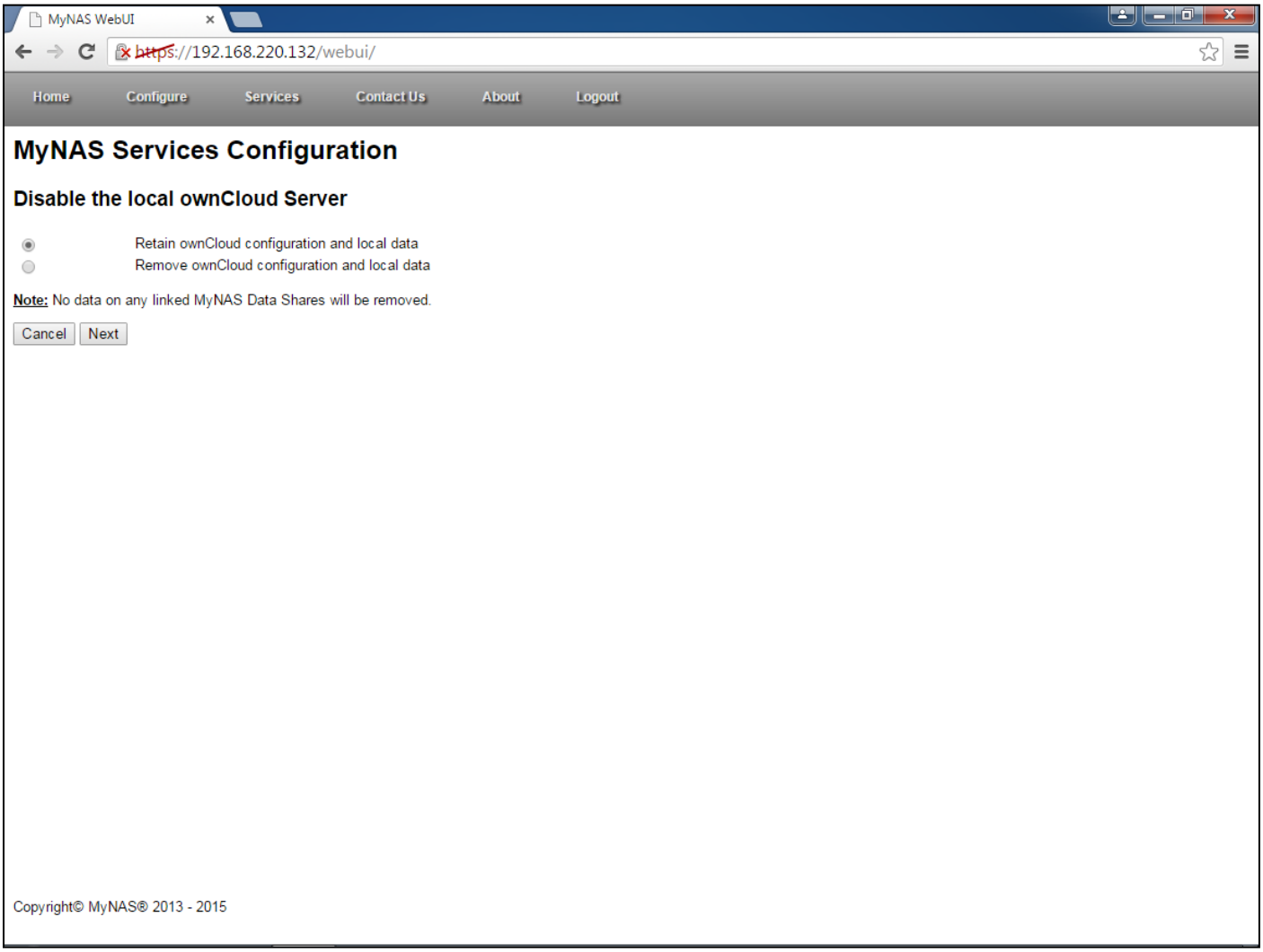


Note: A random password is generated for the ownCloud user account for initial access. This password can however be changed when logged into the local ownCloud instance.

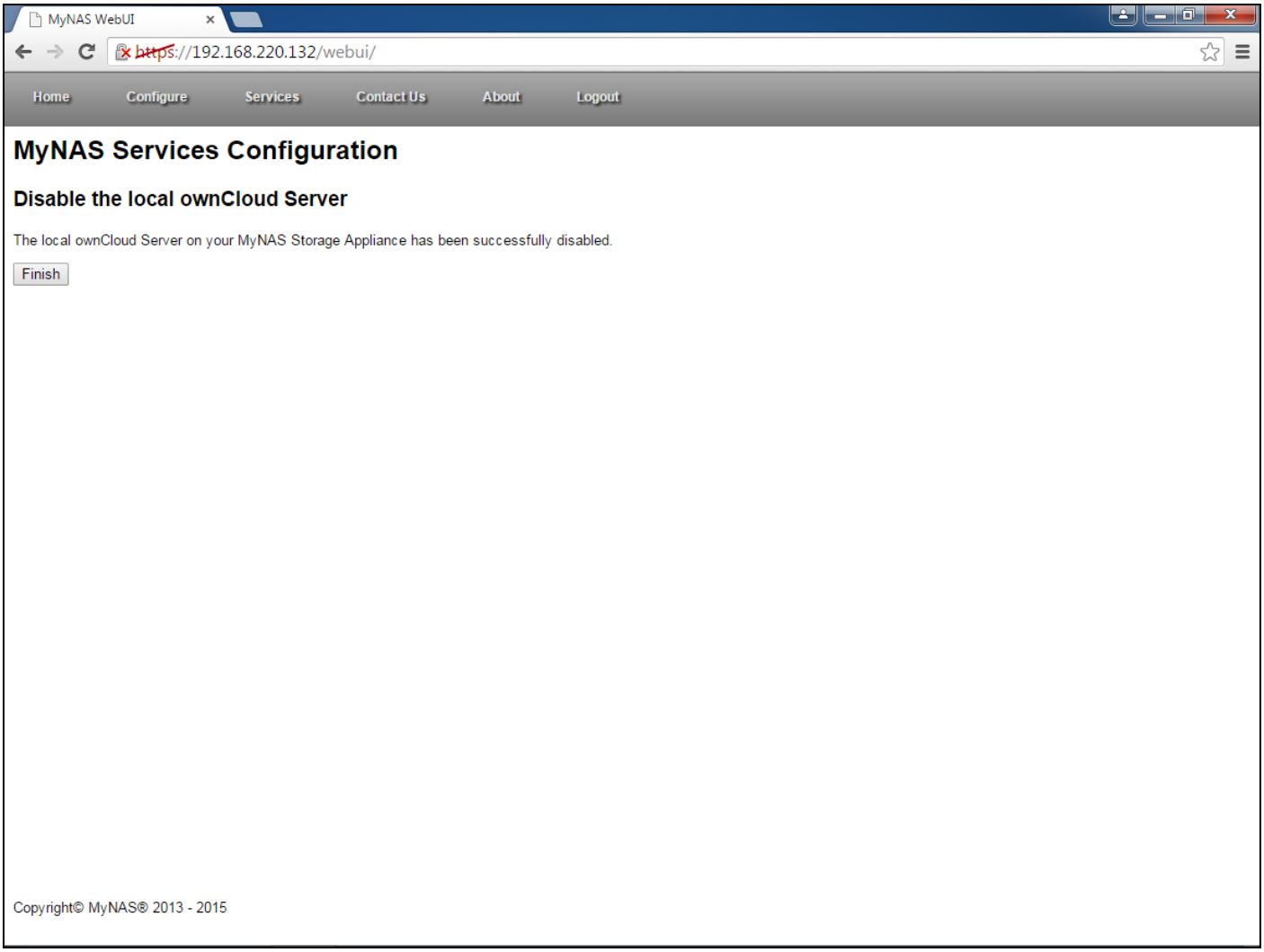
Click Finish to close the wizard.

Disabling the local ownCloud Server

From the WebUI, select the Services Configuration menu and simply click the Disable Local ownCloud Server button and the following will be displayed:



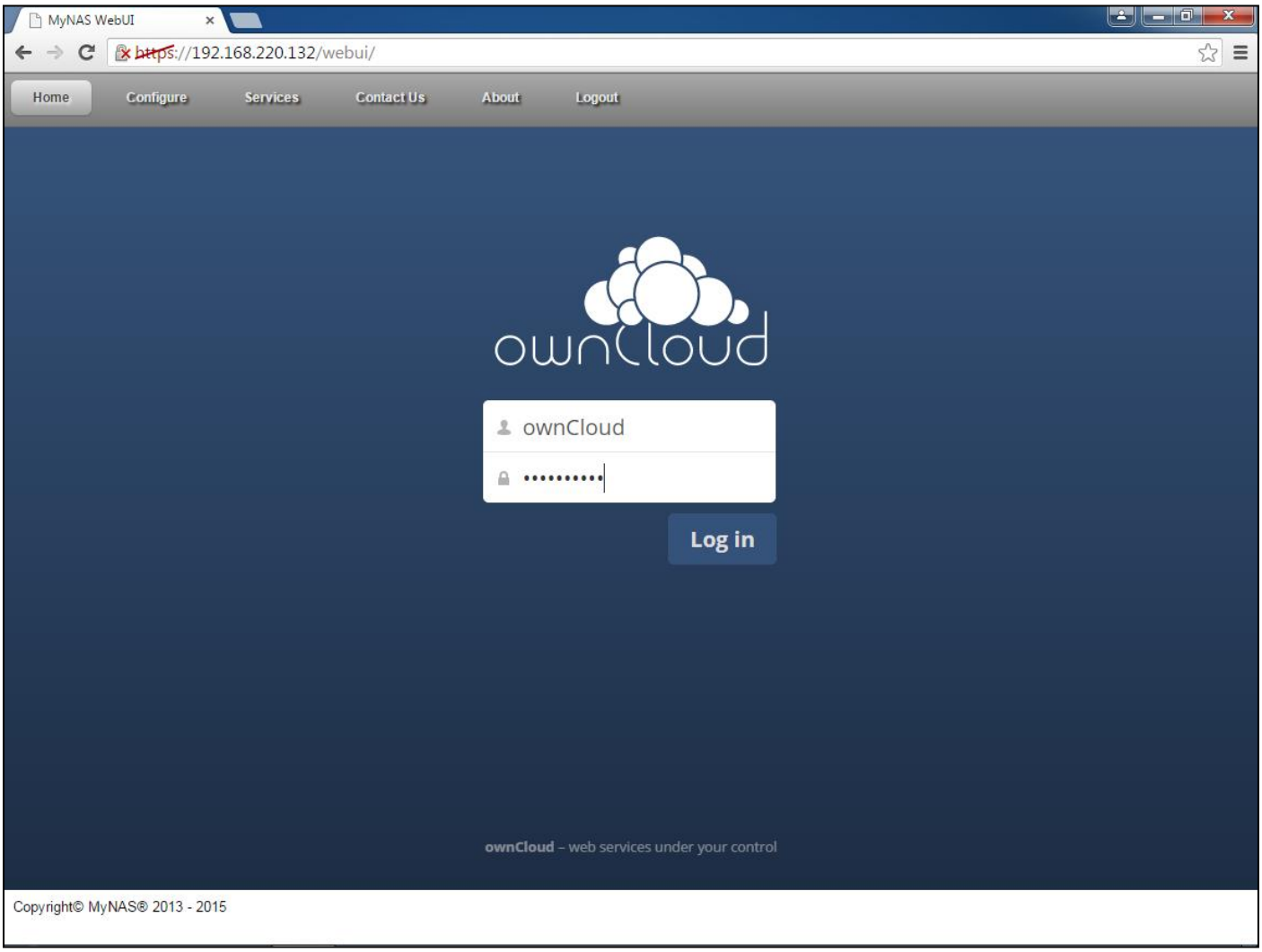
Select the applicable option and click 'Next'



Click 'Finish' to complete the wizard.

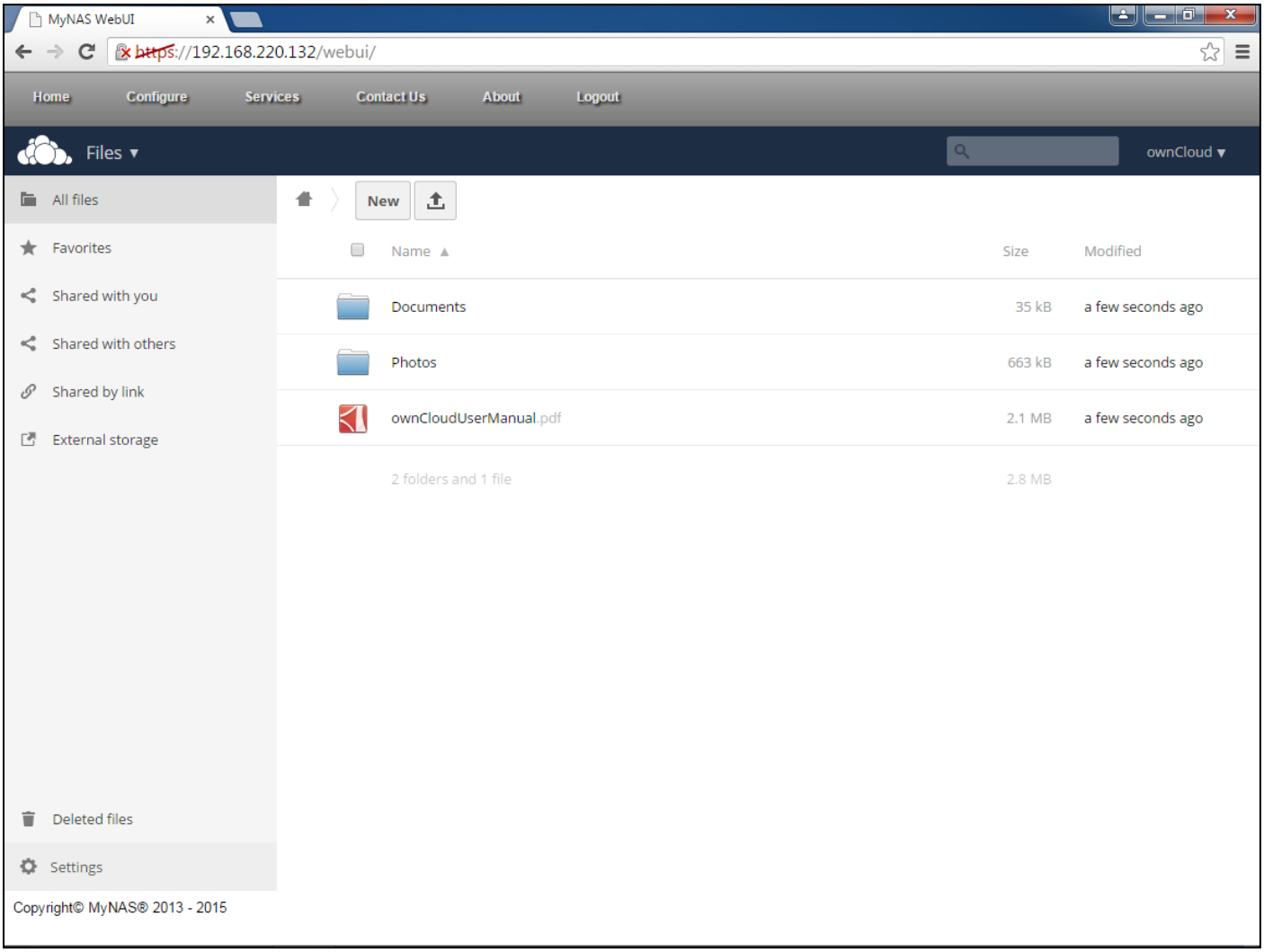
Using your Local ownCloud Server

When the Local ownCloud Server is enabled, click on the 'Services' menu, then the 'ownCloud' drop down to access your local ownCloud server:



Type in your credentials as generated when enabling the local ownCloud Server and click the 'Log in' button.

Once you login, you will be presented with the following screen with a welcome banner. Close the welcome banner to continue with using the local ownCloud server:

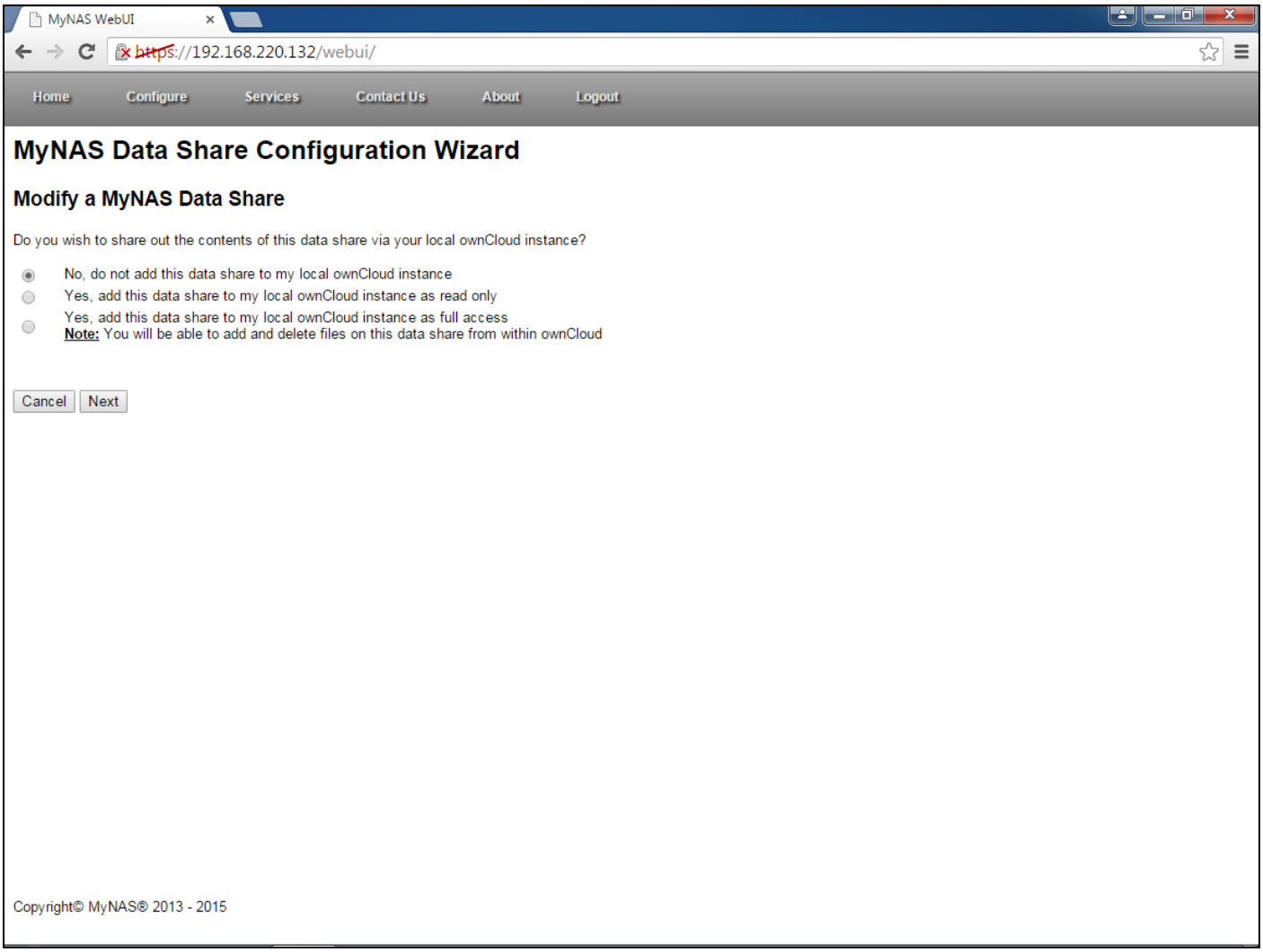


Refer to the ownCloud User Manual on using ownCloud.

Adding a Data Share to ownCloud

The easiest way to integrate your existing MyNAS Data Share's into ownCloud is to run through the Modify Data Share Configuration Wizard.

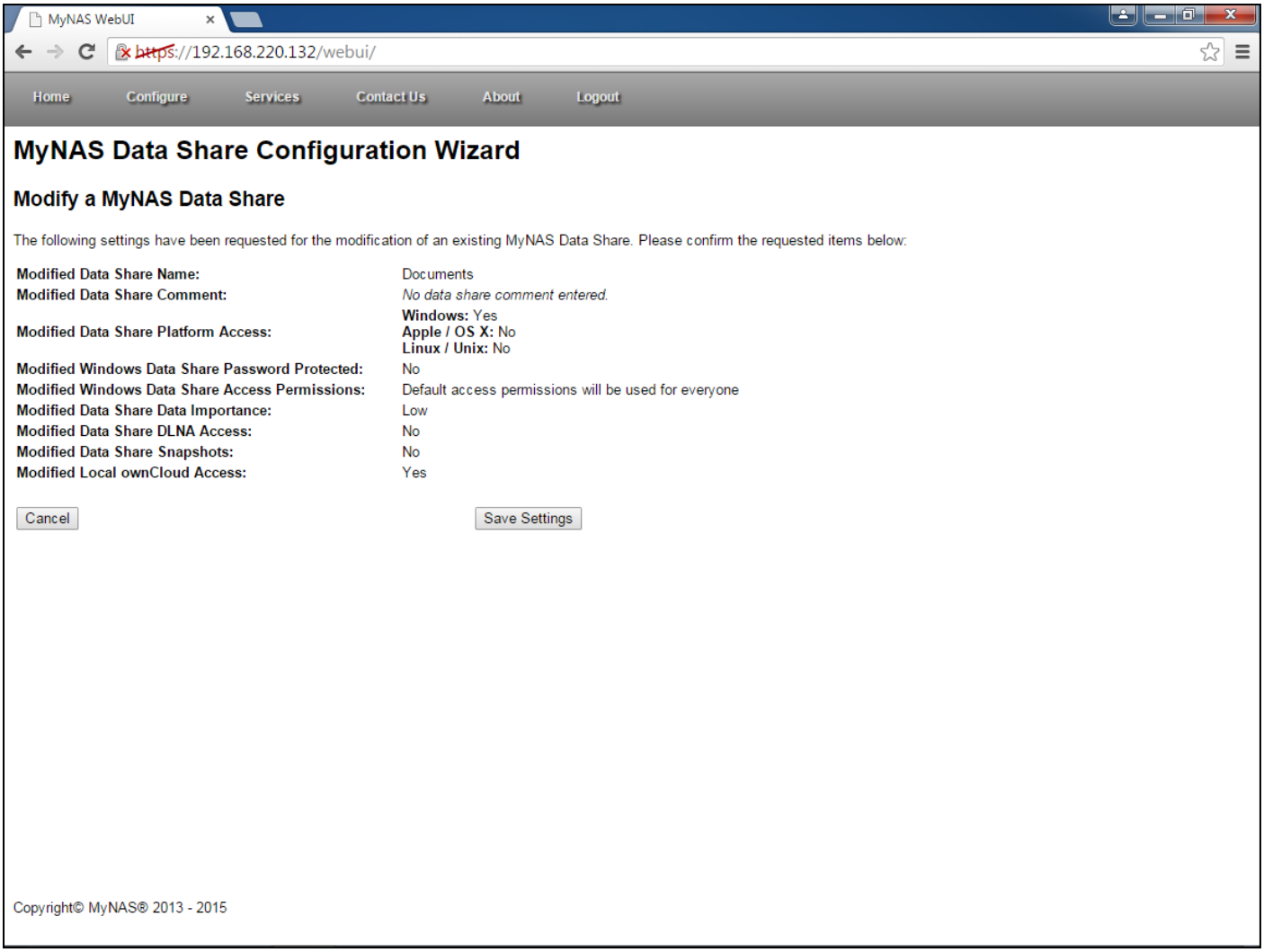
Select the applicable data share, and follow the wizard through modifying the options. As your local ownCloud Server is now configured, a new modify option is presented:



This allows you to add the data share as a read only link, or with full access allowing files to be uploaded through the ownCloud client to automatically sync onto your MyNAS Storage appliance.

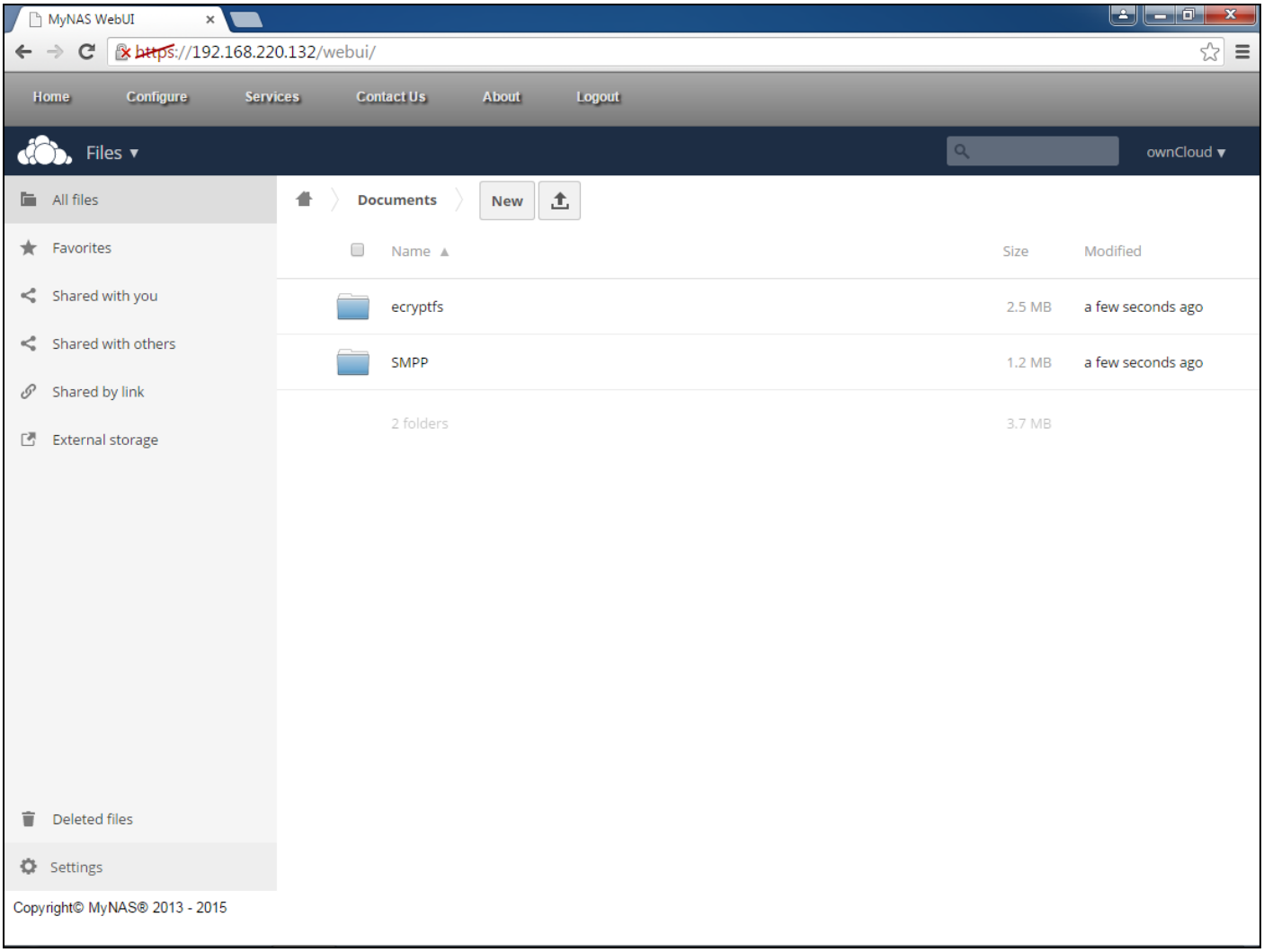
Note: Once the Local ownCloud Server is enabled, the same option is available when creating a new data share.

Select the appropriate option for this Data Share and 'Click Next'



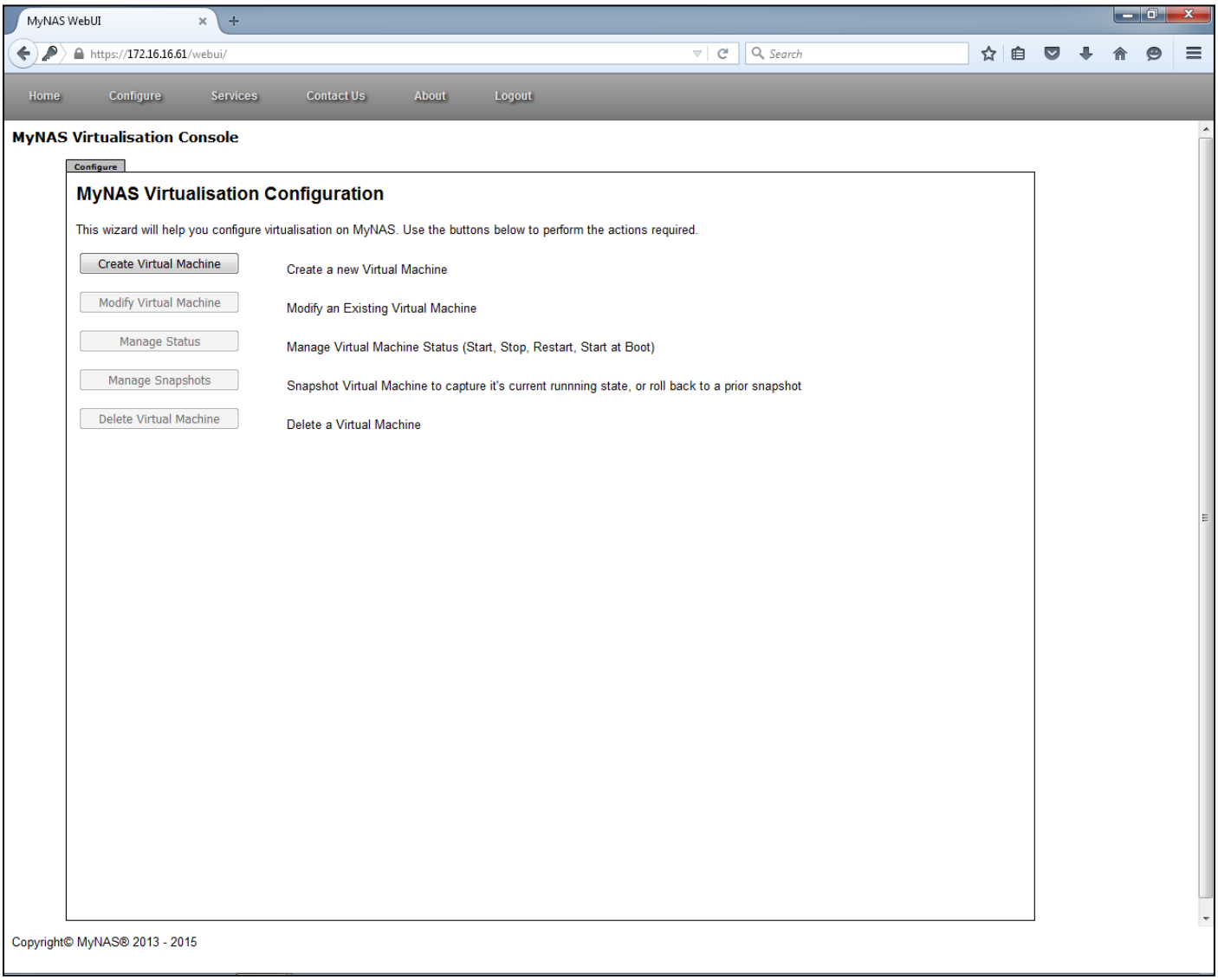
Verify the modified settings, and click 'Save Settings' to make the change.

Open up the ownCloud interface again, and you can see that the files are now linked into ownCloud:


MyNAS WebUI
https://192.168.220.132/webui/
Home
Configure
Services
Contact Us
About
Logout
Files
ownCloud
All files
Favorites
Shared with you
Shared with others
Shared by link
External storage
Deleted files
Settings
Documents
New
Name
Size
Modified
ecryptfs
2.5 MB
a few seconds ago
SMPP
1.2 MB
a few seconds ago
2 folders
3.7 MB
Copyright© MyNAS® 2013 - 2015

Using Xen Virtualisation

Once Xen Virtualisation is configured and enabled, the Xen Virtualisation portal can be accessed by clicking on the 'Service' menu and clicking 'Virtualisation'. When selected the following will be displayed.



Virtualisation Console Prerequisites

Note: Java can no longer be used inside Google Chrome. For any virtualisation system access, it is recommended to use Firefox at this time.

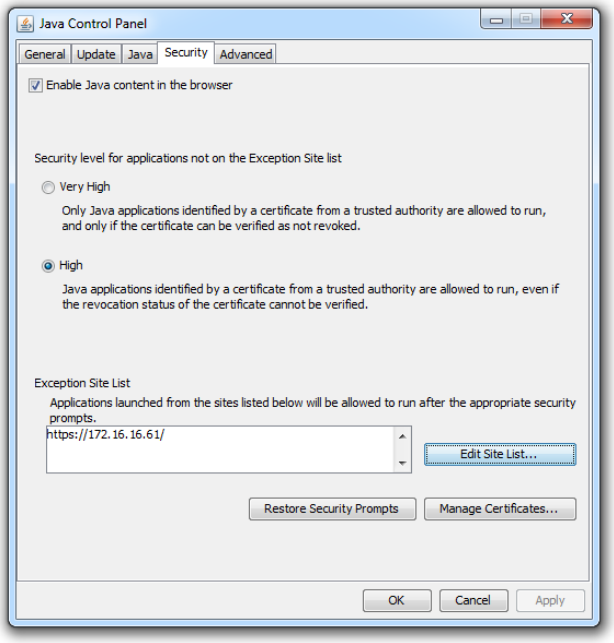
Java Version

In order to view the console of the virtual machines once created, Java is required to be installed on your local system, Java SE version 7 is required. To download Java SE version 7, visit http://www.oracle.com/technetwork/java/javase/downloads/index.html

The MyNAS WebUI has been tested using Java SE version 7 Update 80.

Note: The Java viewer for Xen is currently incompatible with Java SE version 8, however a solution is being worked on for this version of Java.

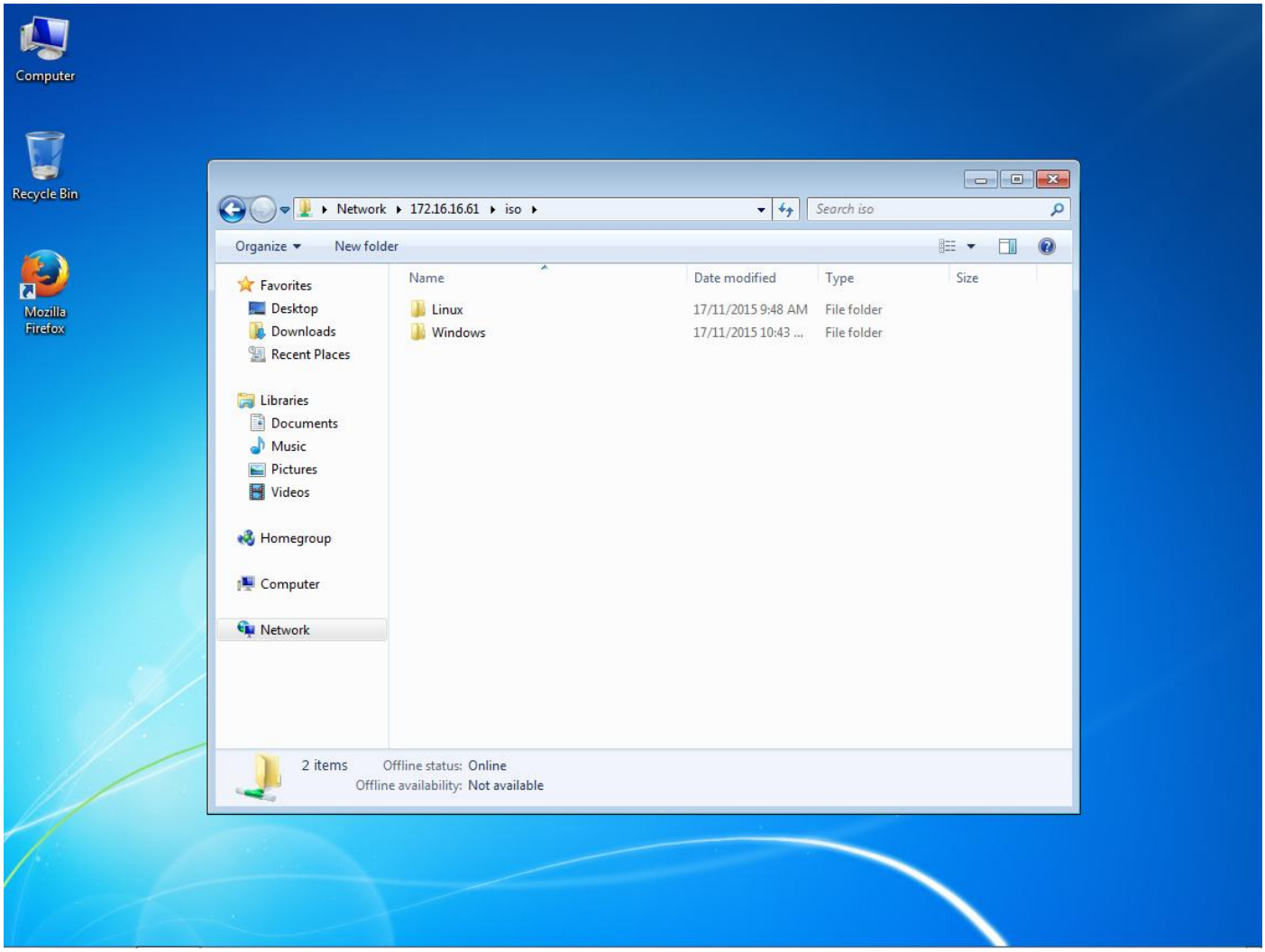
Additionally, due to Java and new enhanced security requirements, Java needs to be configured by adding your MyNAS host into the exception list as illustrated below:



This allows the Java applet to operate without being explicitly blocked due to the applet not being digitally signed.

Installation ISO Images

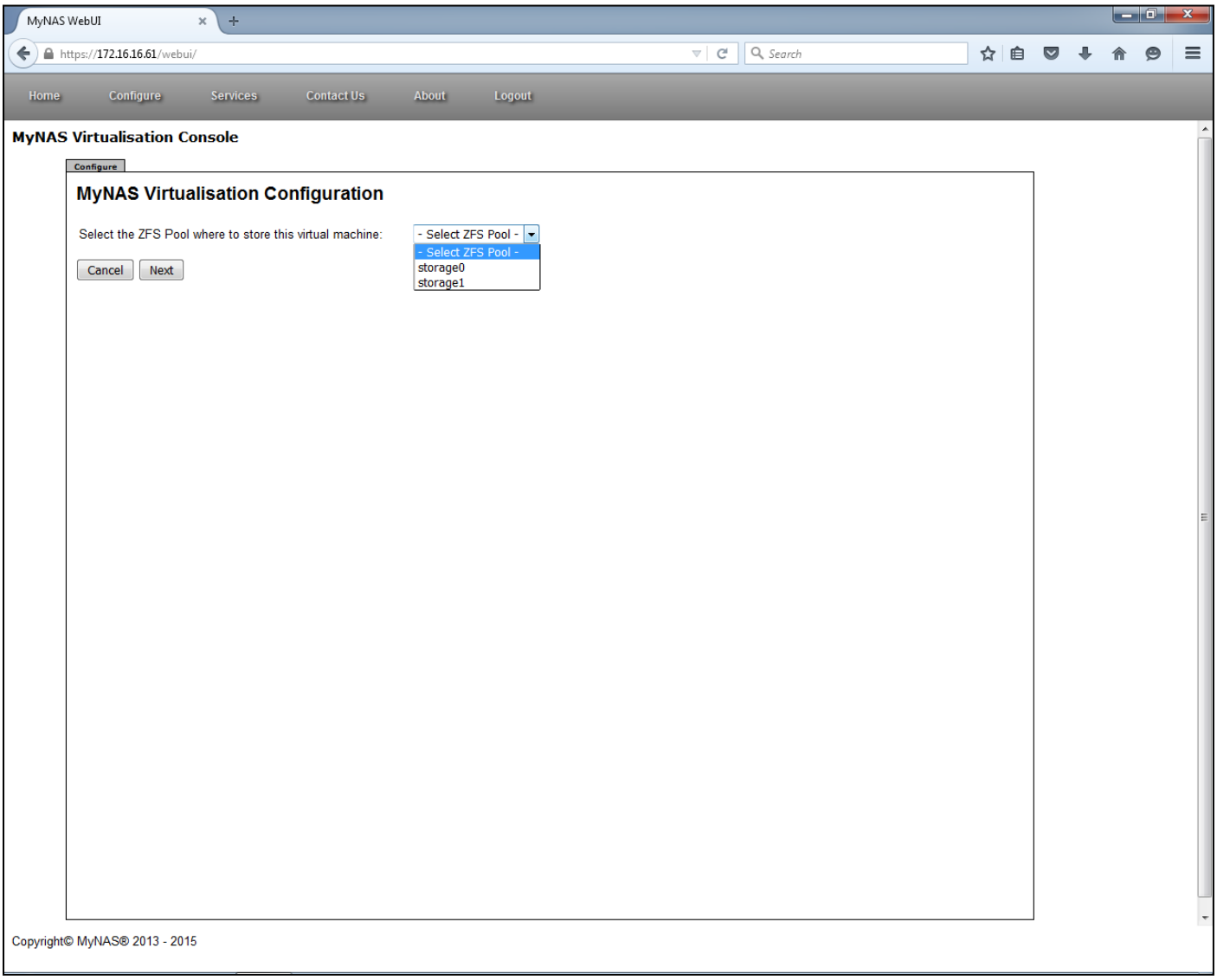
In order to create a virtual machine, the virtual machine requires to be installed via an ISO file. It is recommended to create a separate Data Share that is for the storage of the installation ISO files for your virtual machines. For the purpose of this section, a Data Share called 'iso' will be used, populated by Linux and Windows installation media.


Computer
Recycle Bin
Mozilla Firefox
Network ▸ 172.16.16.61 ▸ iso ▸
Search iso
Organize
New folder
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Homegroup
Computer
Network
Name
Date modified
Type
Size
Linux
17/11/2015 9:48 AM
File folder
Windows
17/11/2015 10:43 ...
File folder
2 items
Offline status: Online
Offline availability: Not available

Create a new Virtual Machine

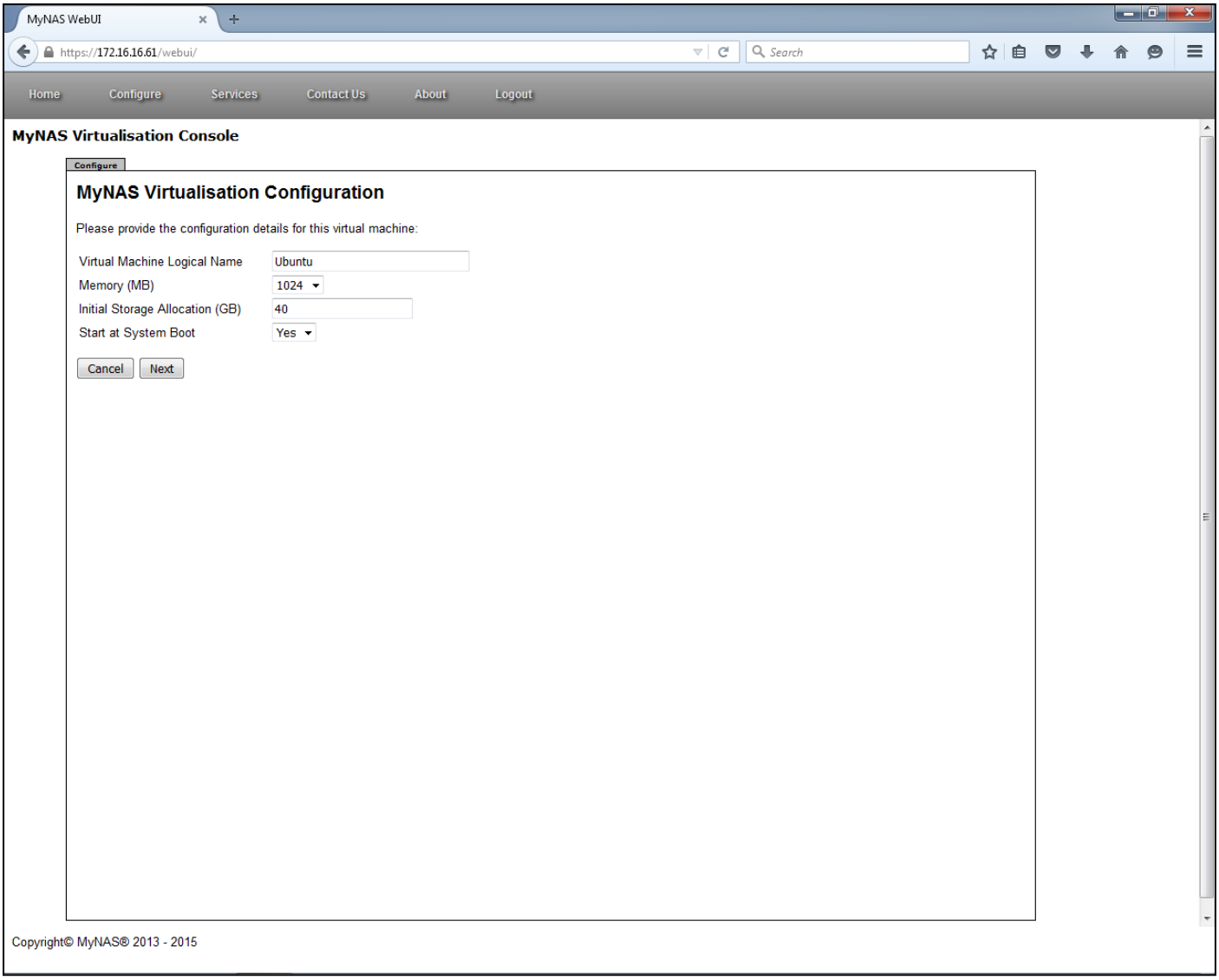
To create a new virtual machine, click on the 'Create Virtual Machine' button to start the VM creation wizard

If there are multiple ZFS Pools to select, select the appropriate ZFS pool to use for this virtual machine



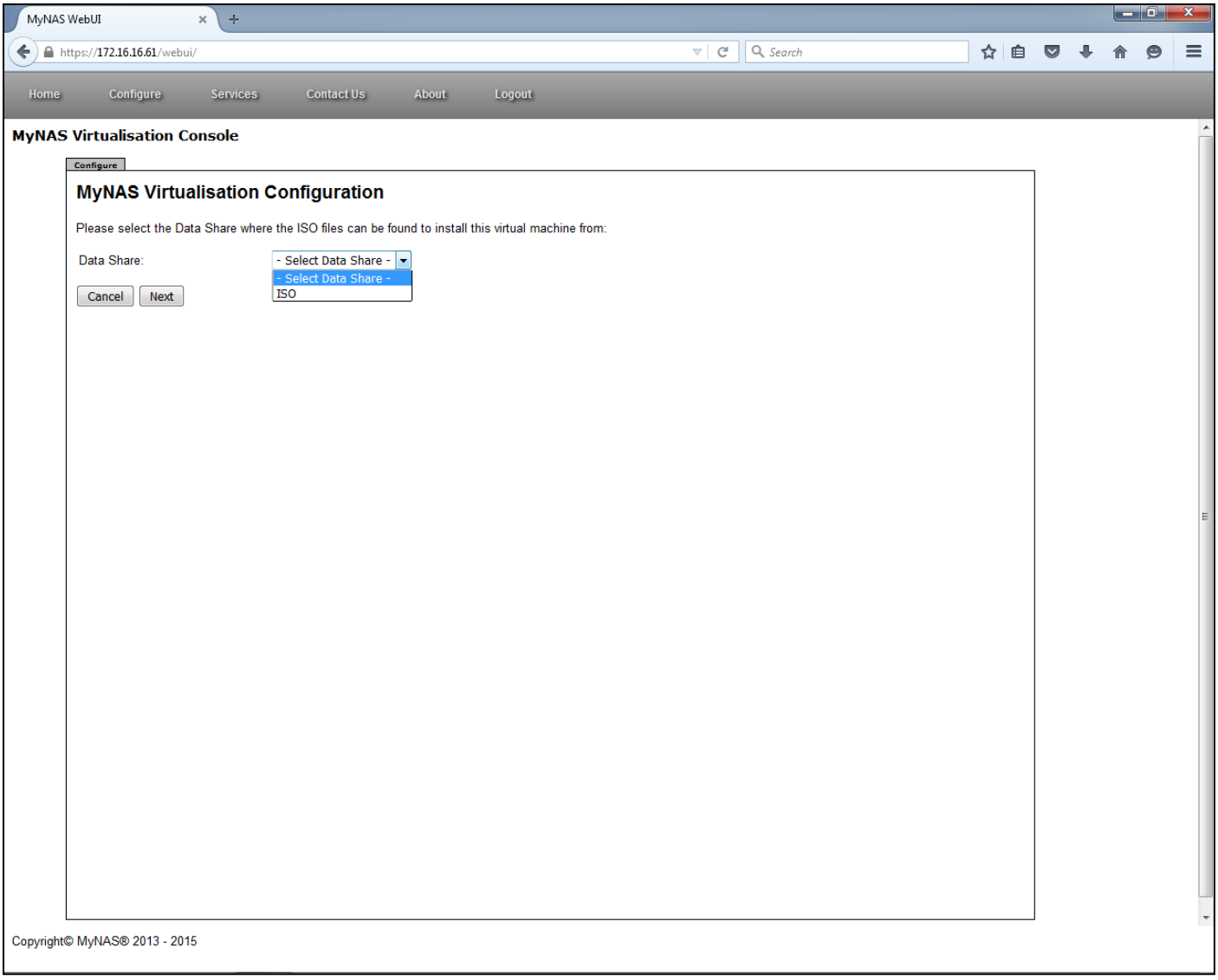
Once the right ZFS pool is selected, click 'Next'

Type in the appropriate details for the new virtual machine



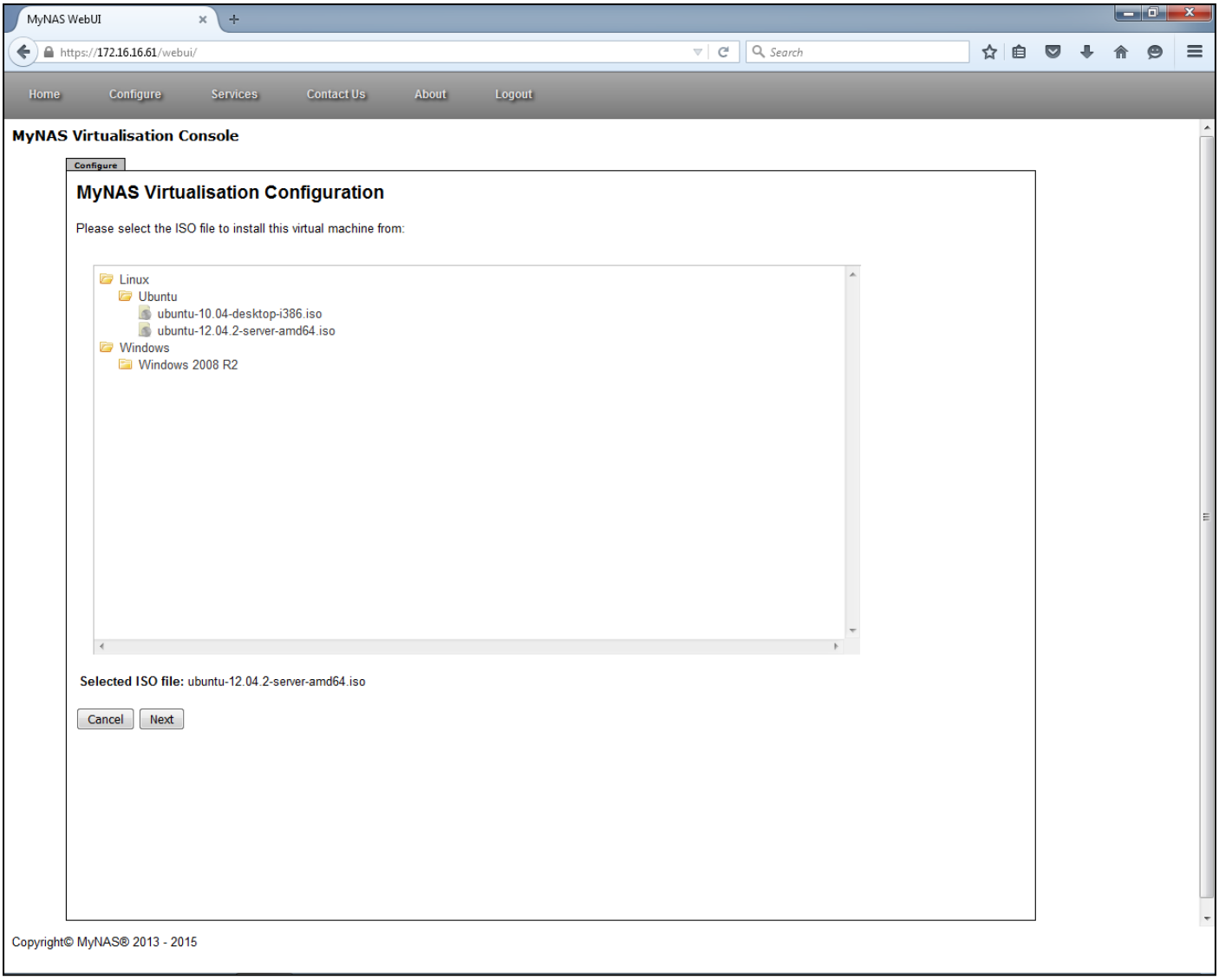
Once the details are entered, click 'Next'

Select the Data Share where the ISO to install the virtual machine can be found



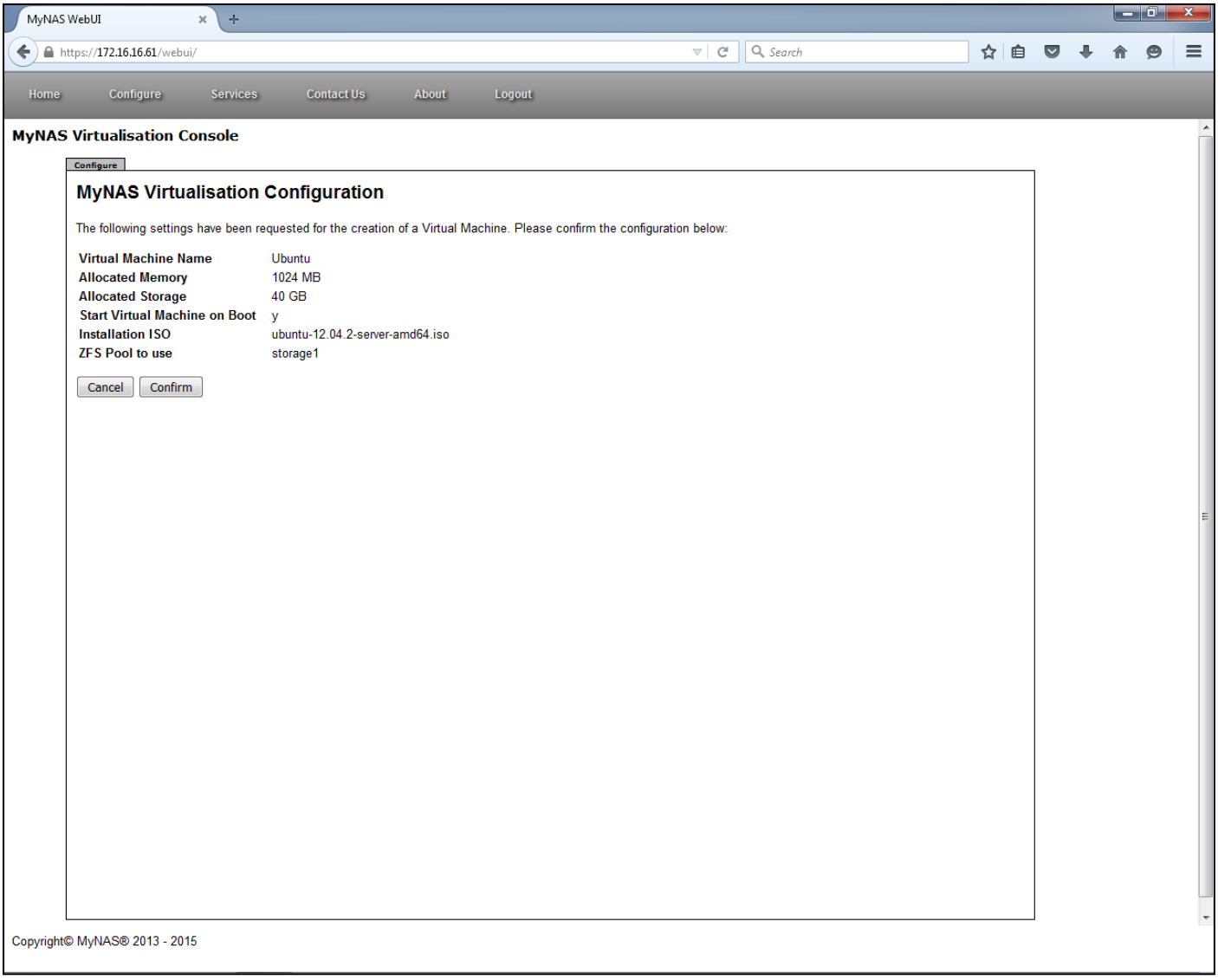
Once the correct Data Share is selected, click 'Next'

Select the ISO file to install the virtual machine with



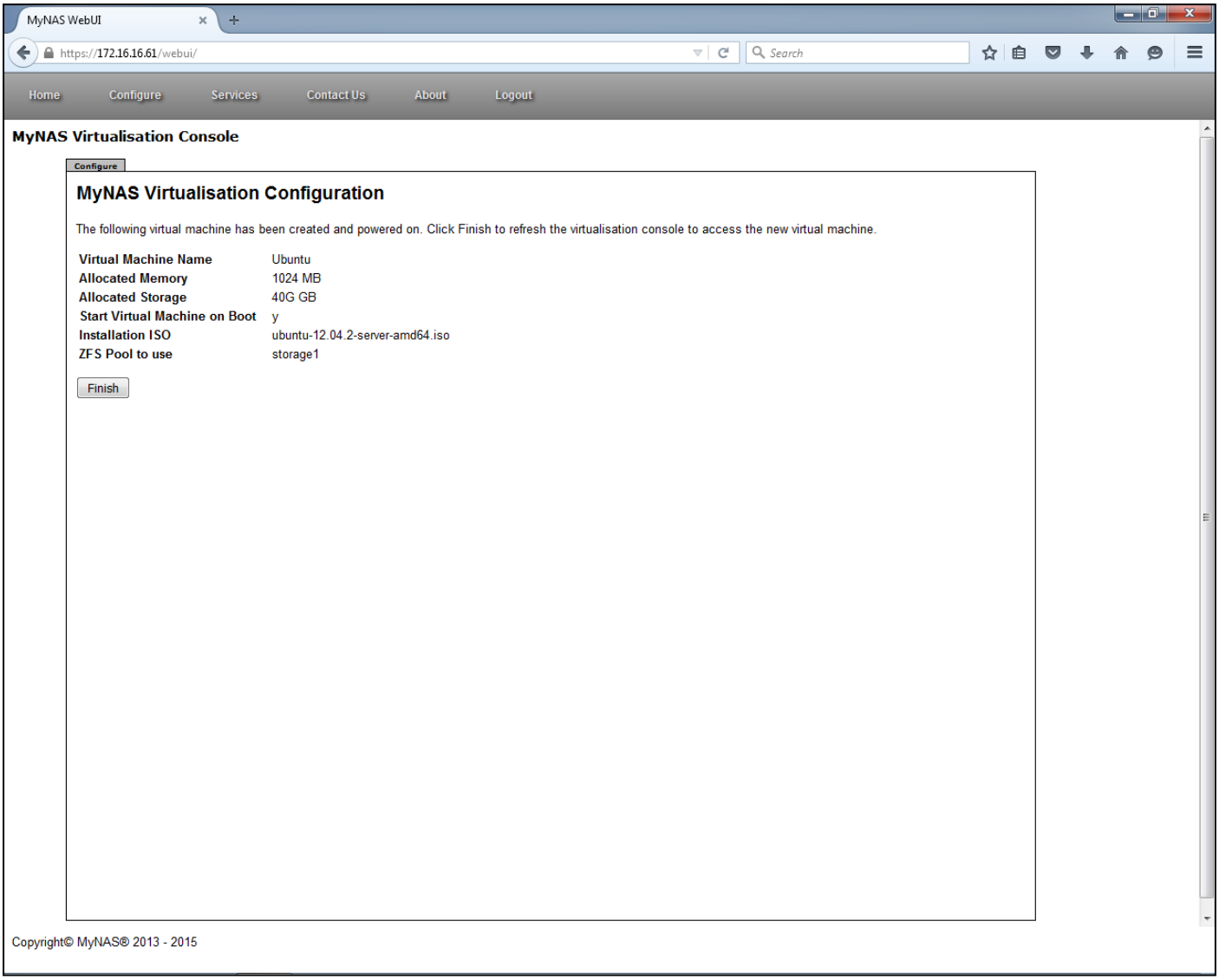
To select the ISO file, double click the file name. Once selected, click 'Next'

Confirm the virtual machine settings as entered



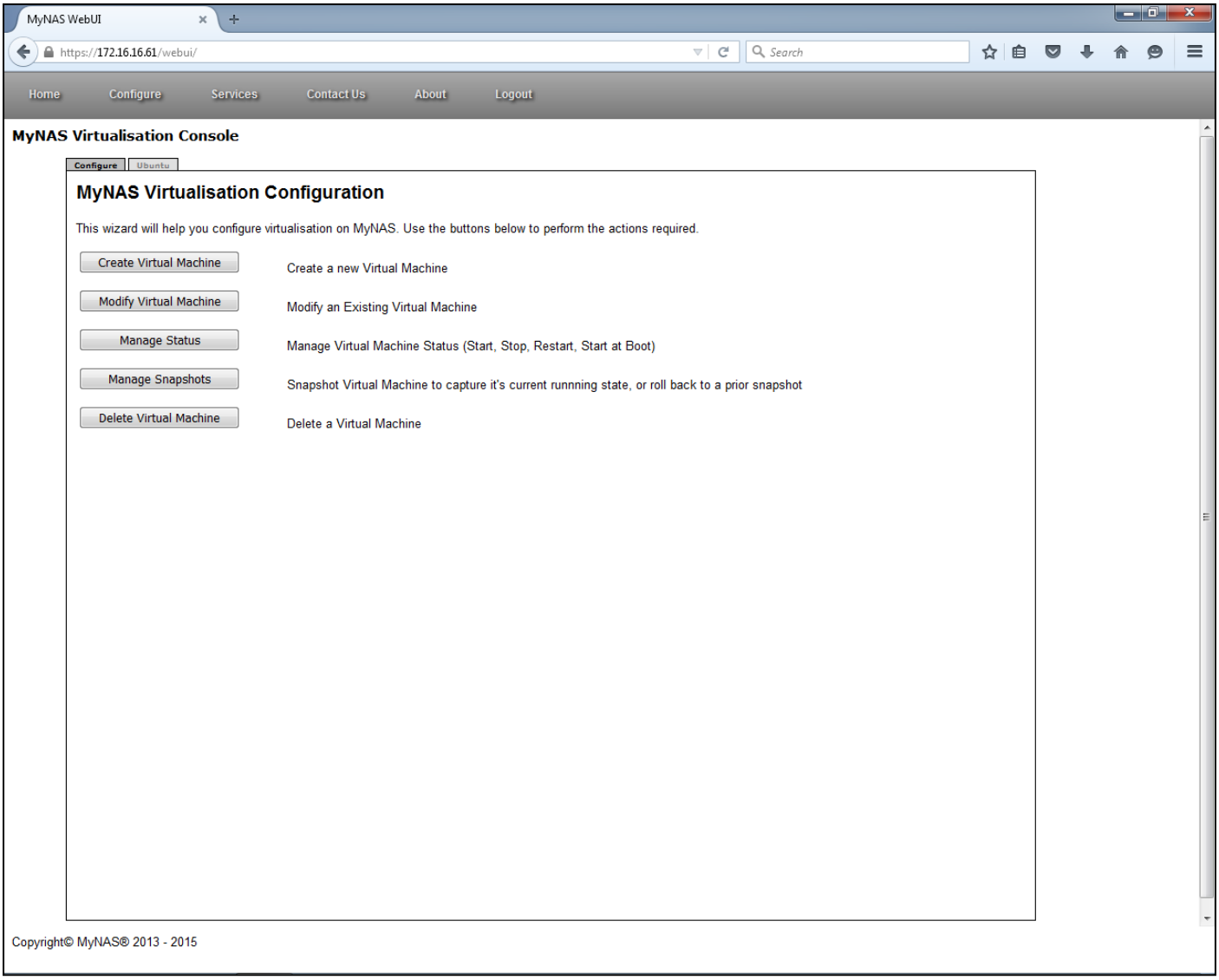
If the settings selected are OK, click 'Confirm'.

The virtual machine will now be created. If there are enough resources available, the virtual machine will be powered on.



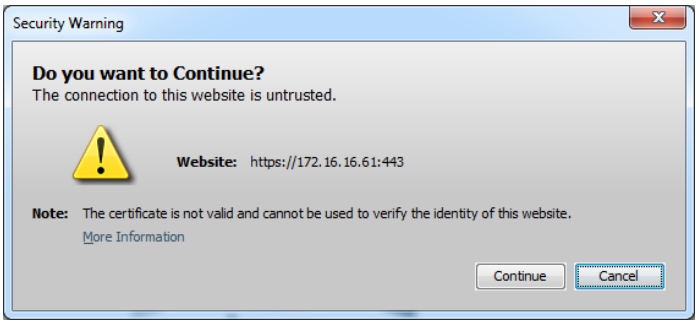
Click 'Finish' to complete the wizard, which will take you back to the virtualisation configuration page.

On loading the configuration page, a new tab will be displayed, which represents the new virtual machine.

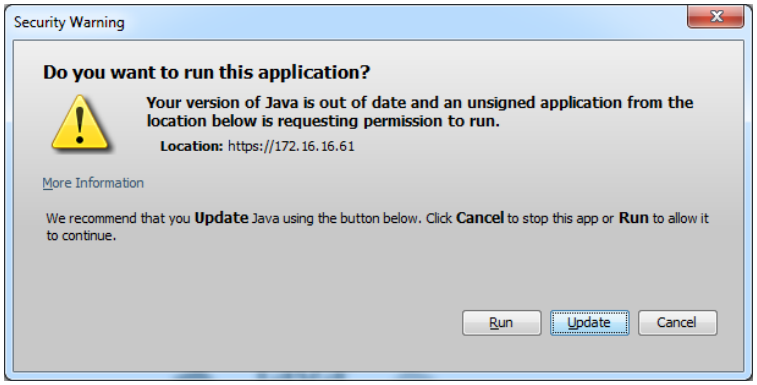


Click the tab of the virtual machine name to access the console of the new virtual machine.

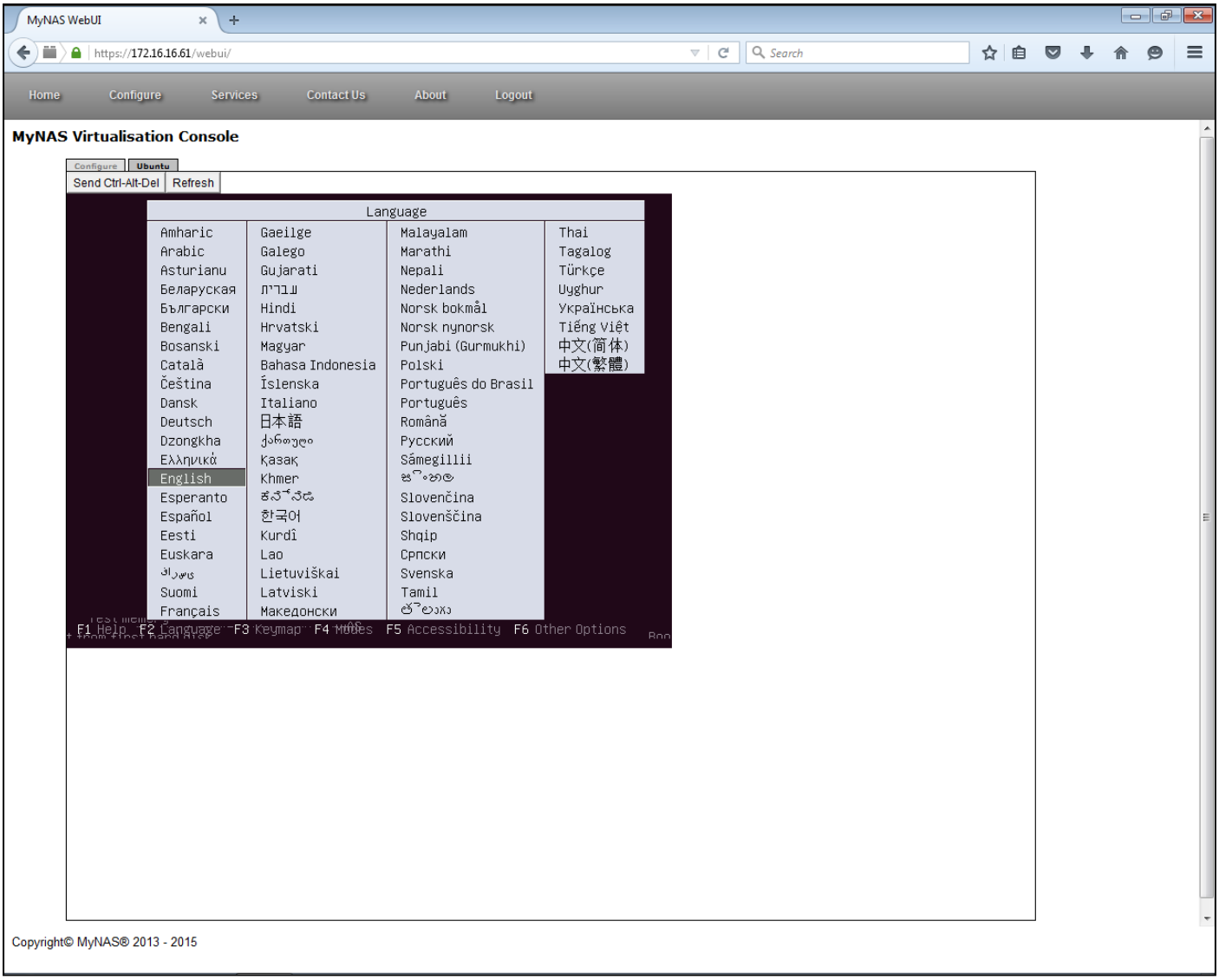
A Java warning window will be displayed - click continue



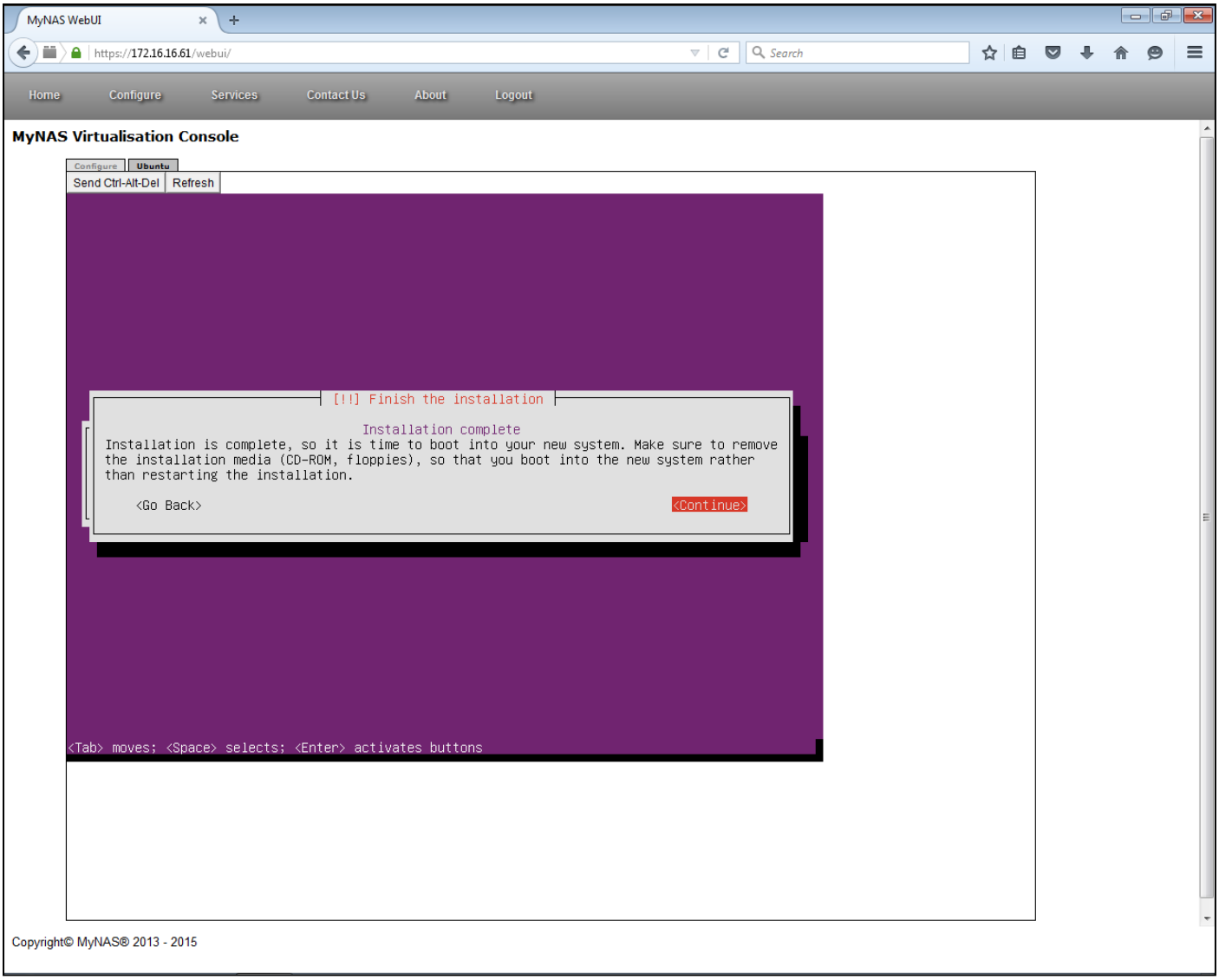
A second Java security window will then be displayed



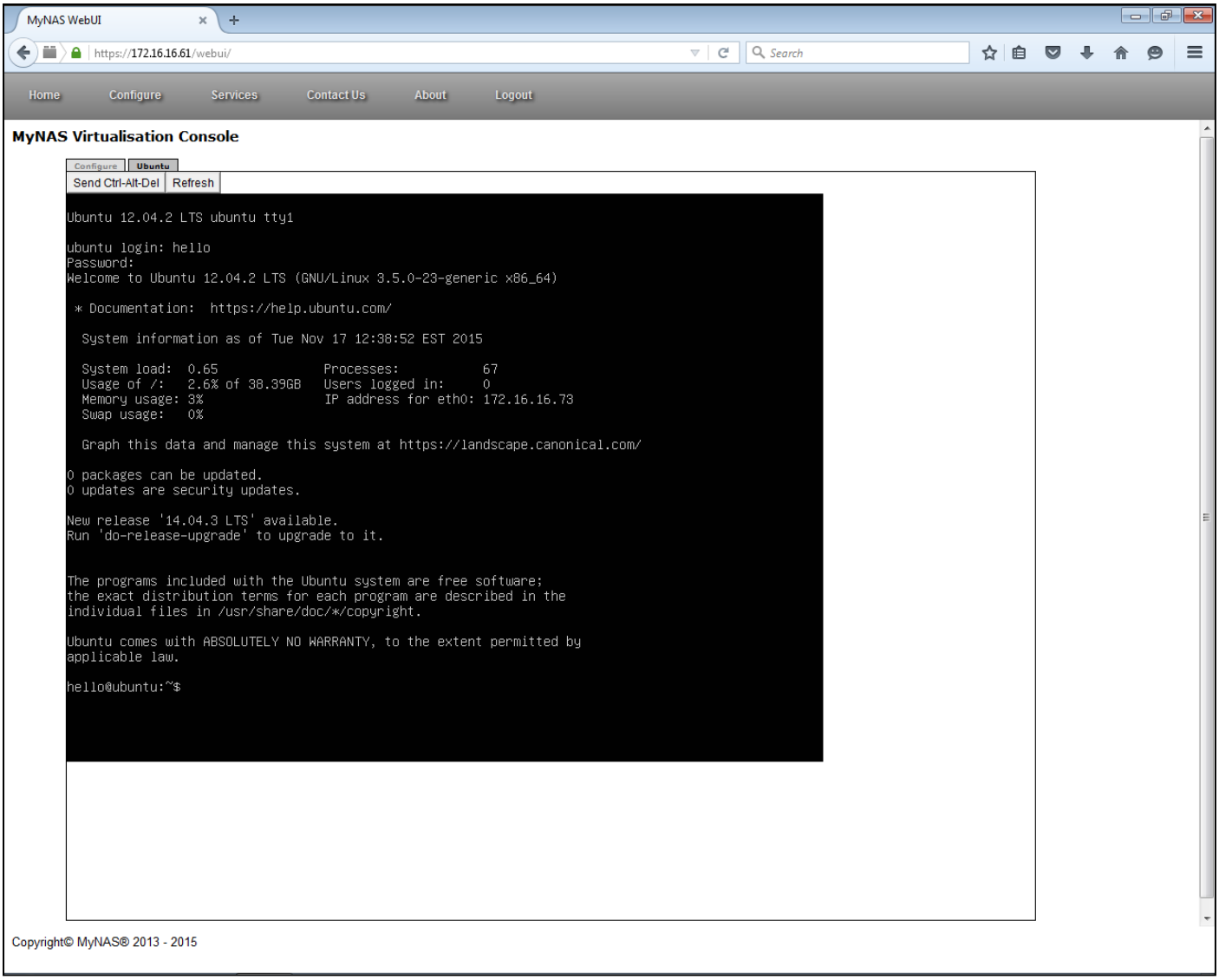
Click Run, and the Java applet will run, displaying the console of the virtual machine



Install the virtual machine as per normal for that operating system



Once the OS is installed on the virtual machine it should be ready to use.

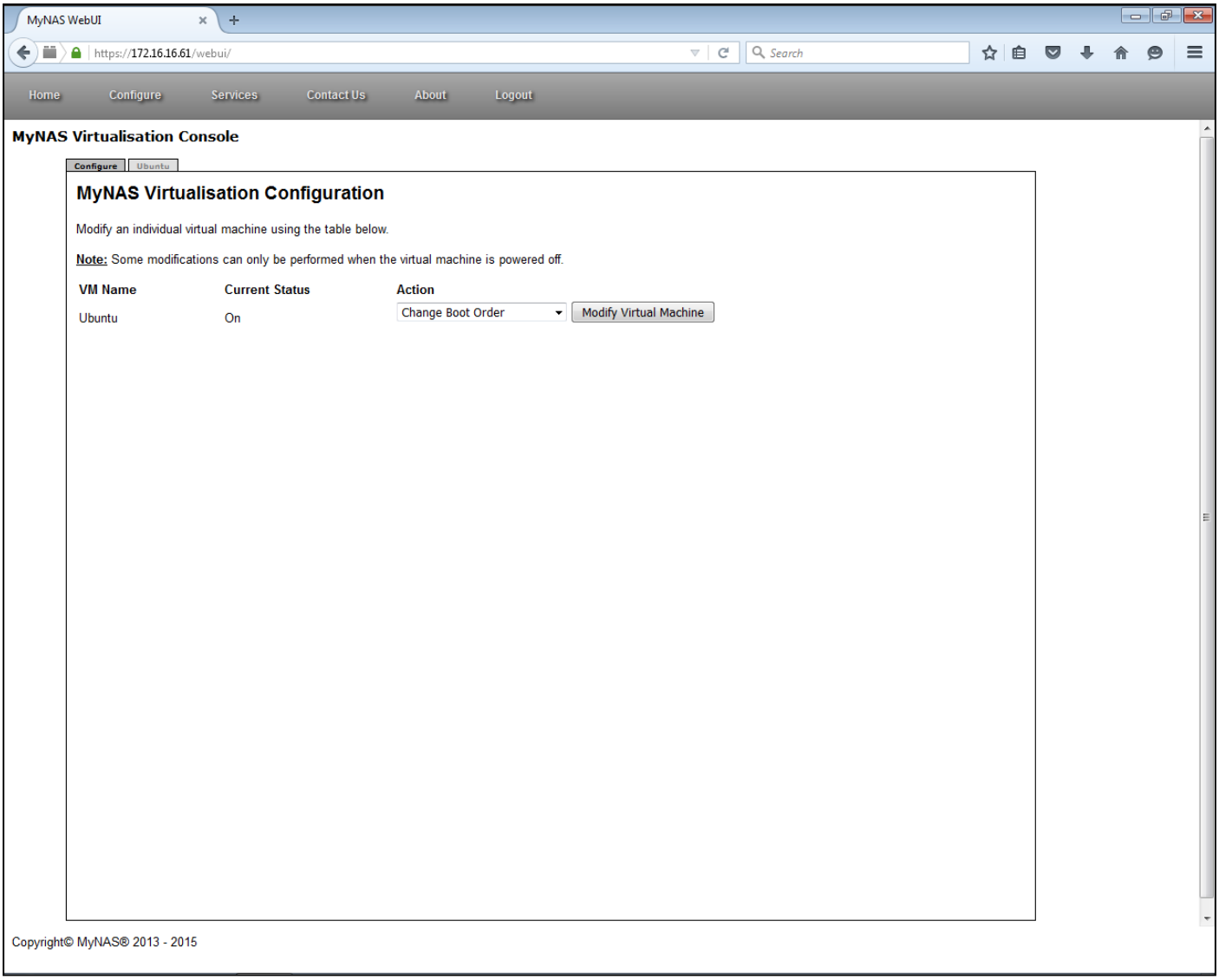


Note: Depending on the OS, it may also be best to shut down the OS to perform the following operations:

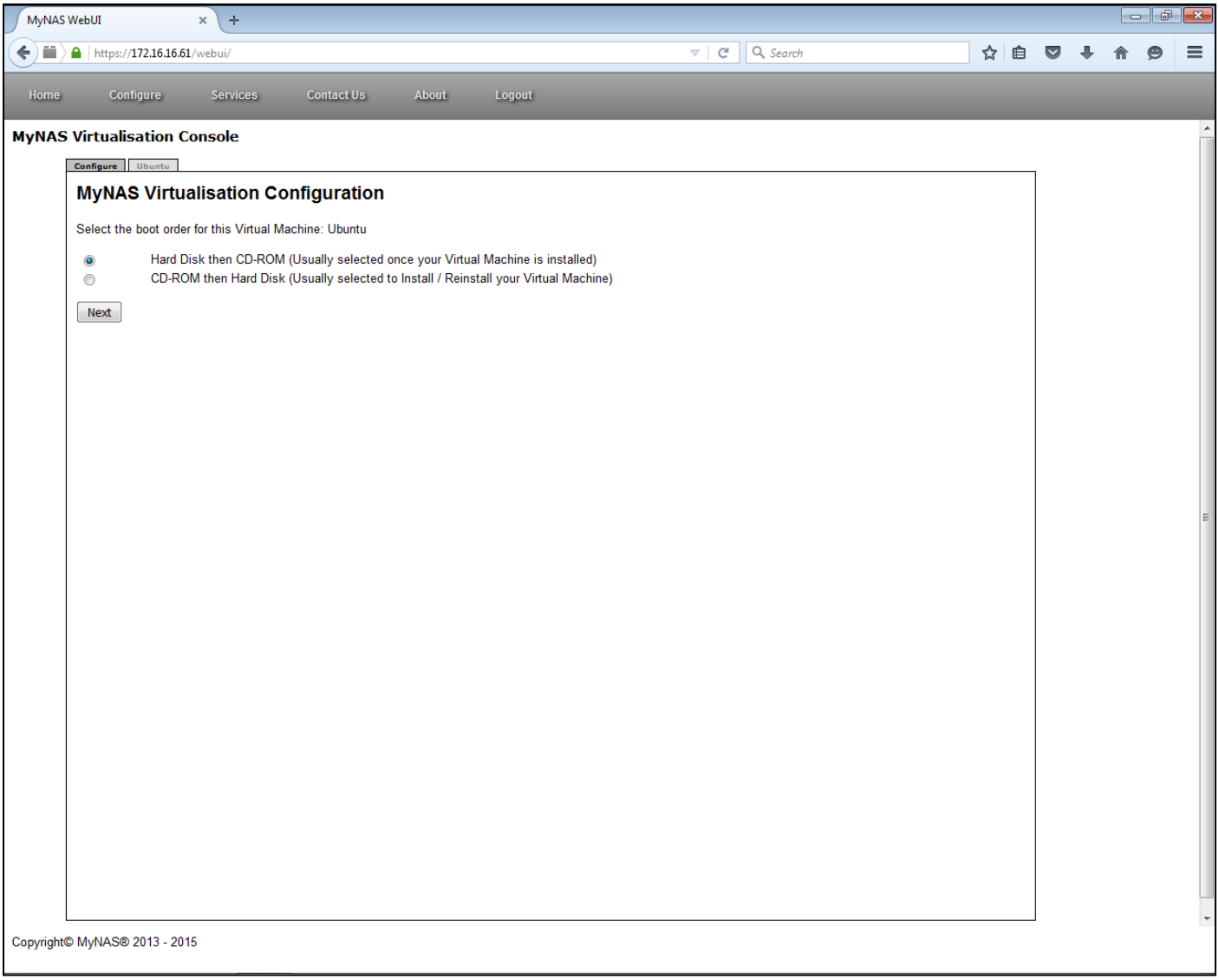
1. Change the boot order of the virtual machine
2. Disconnect the installation ISO file from the virtual machine

Changing the boot order of the virtual machine

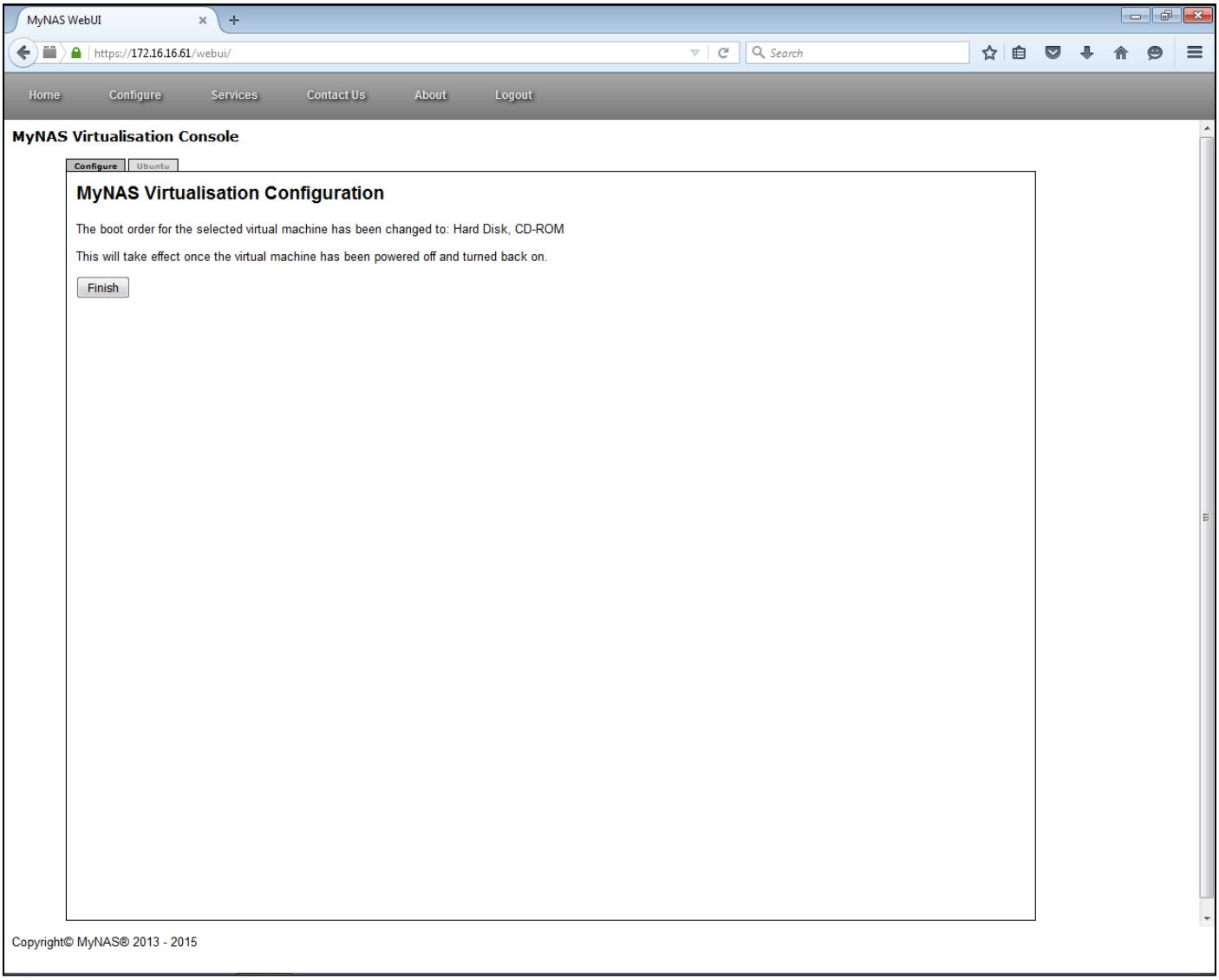
To change the boot order, from the MyNAS Virtual Configuration, select to 'Modify Virtual Machine'



Select the appropriate action - in this case, changing the boot order, and click the 'Modify Virtual Machine' button.



Select the appropriate boot order for the virtual machine, and click 'Next'

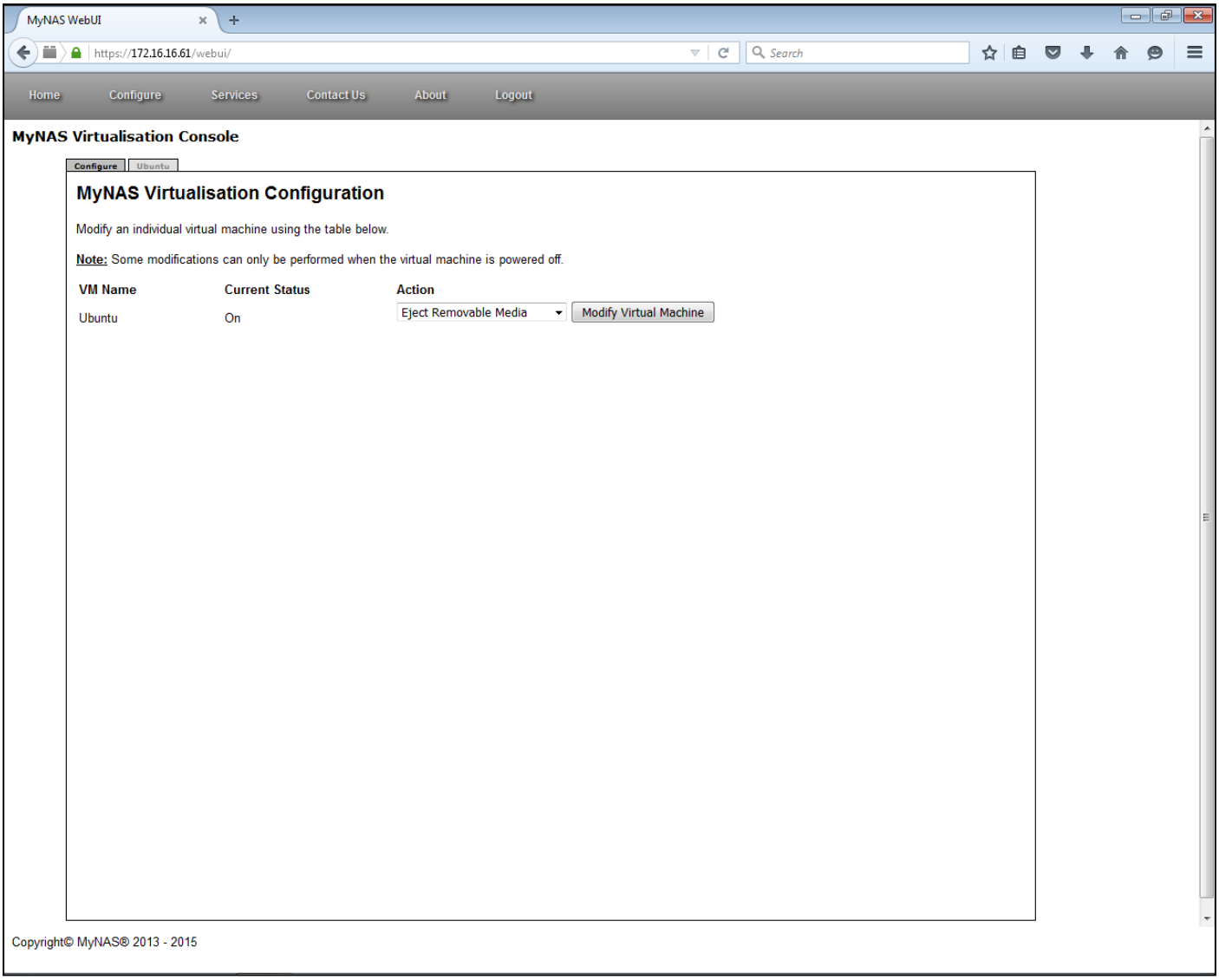


The selected option is processed. Click 'Finish' to complete.

Note: Any change in this setting is only reflected once the virtual machine is powered off and powered back on.

Disconnecting the installation ISO from the virtual machine

To disconnect the installation ISO, from the MyNAS Virtual Configuration, select to 'Modify Virtual Machine'



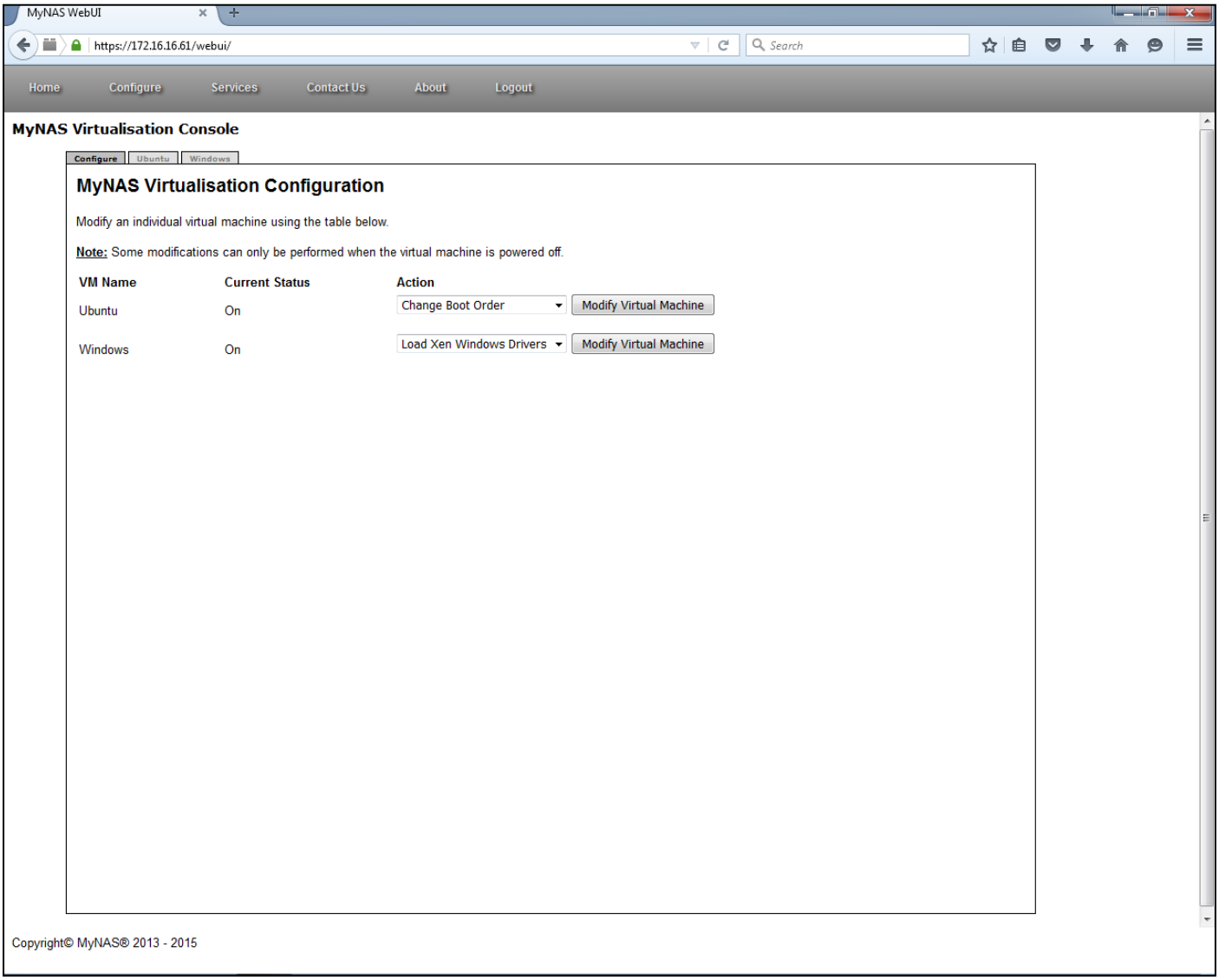
Select the appropriate action - in this case, ejecting removable media, and click the 'Modify Virtual Machine' button.

The action will be processed and you will be returned to the modify action selection.

Windows Xen Virtualisation Drivers

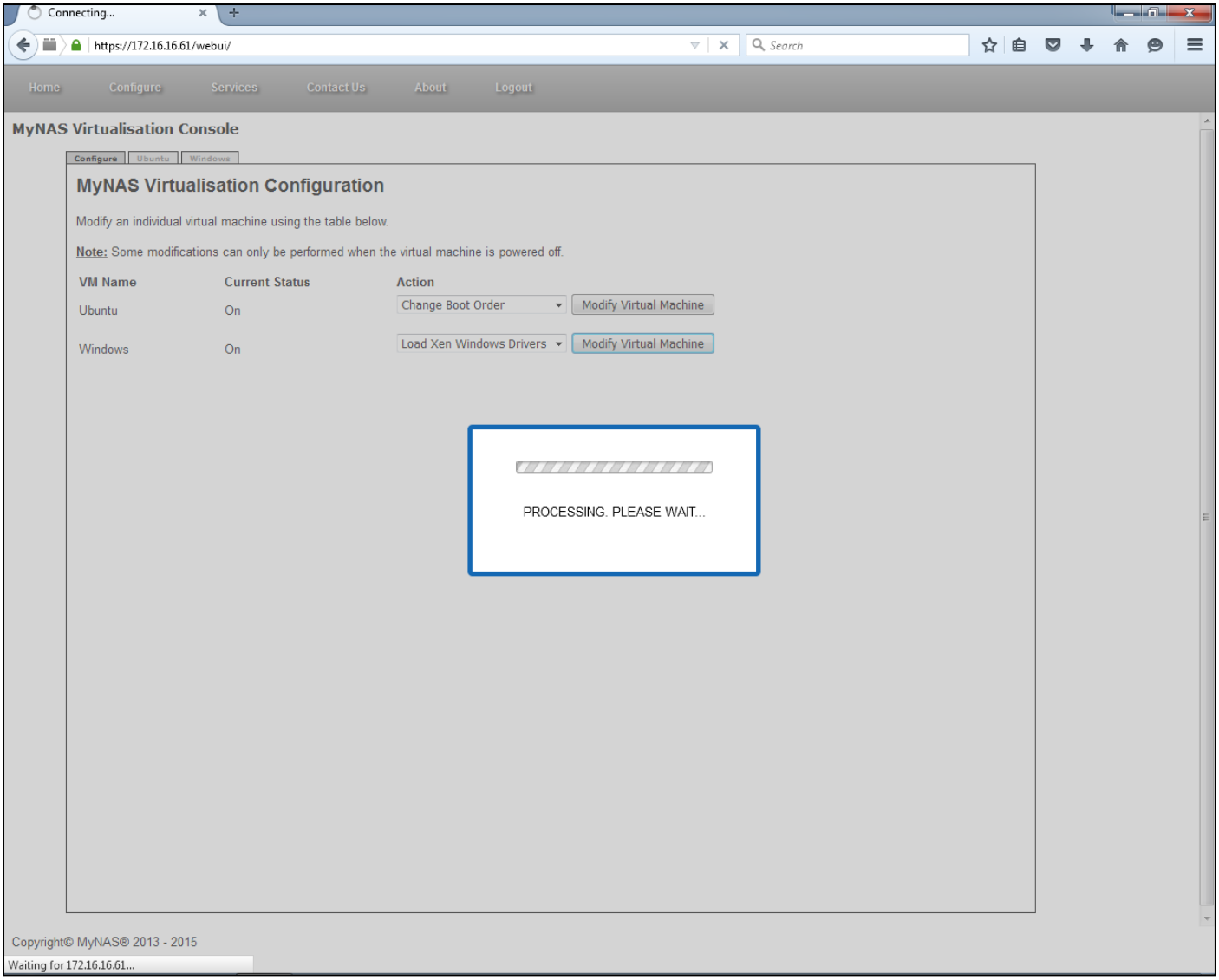
If a Windows operating system is running on MyNAS under Xen, to get the best performance from the Windows system, it is advisable to load the Xen virtualisation drivers.

From the MyNAS Virtual Configuration, select to 'Modify Virtual Machine'

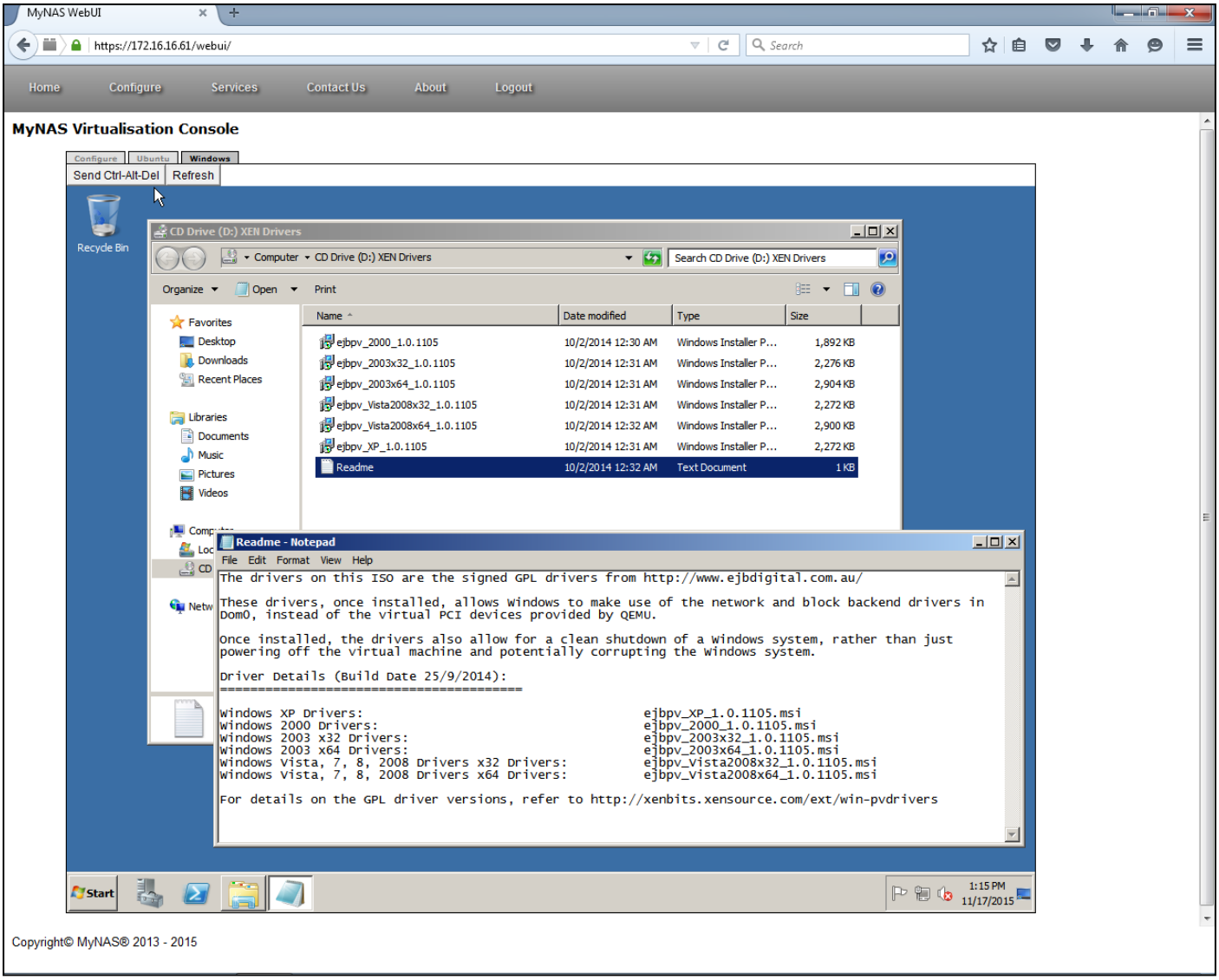


For the Windows virtual machine, select the appropriate action - in this case 'Load Xen Windows Drivers. Click the 'Modify Virtual Machine' button

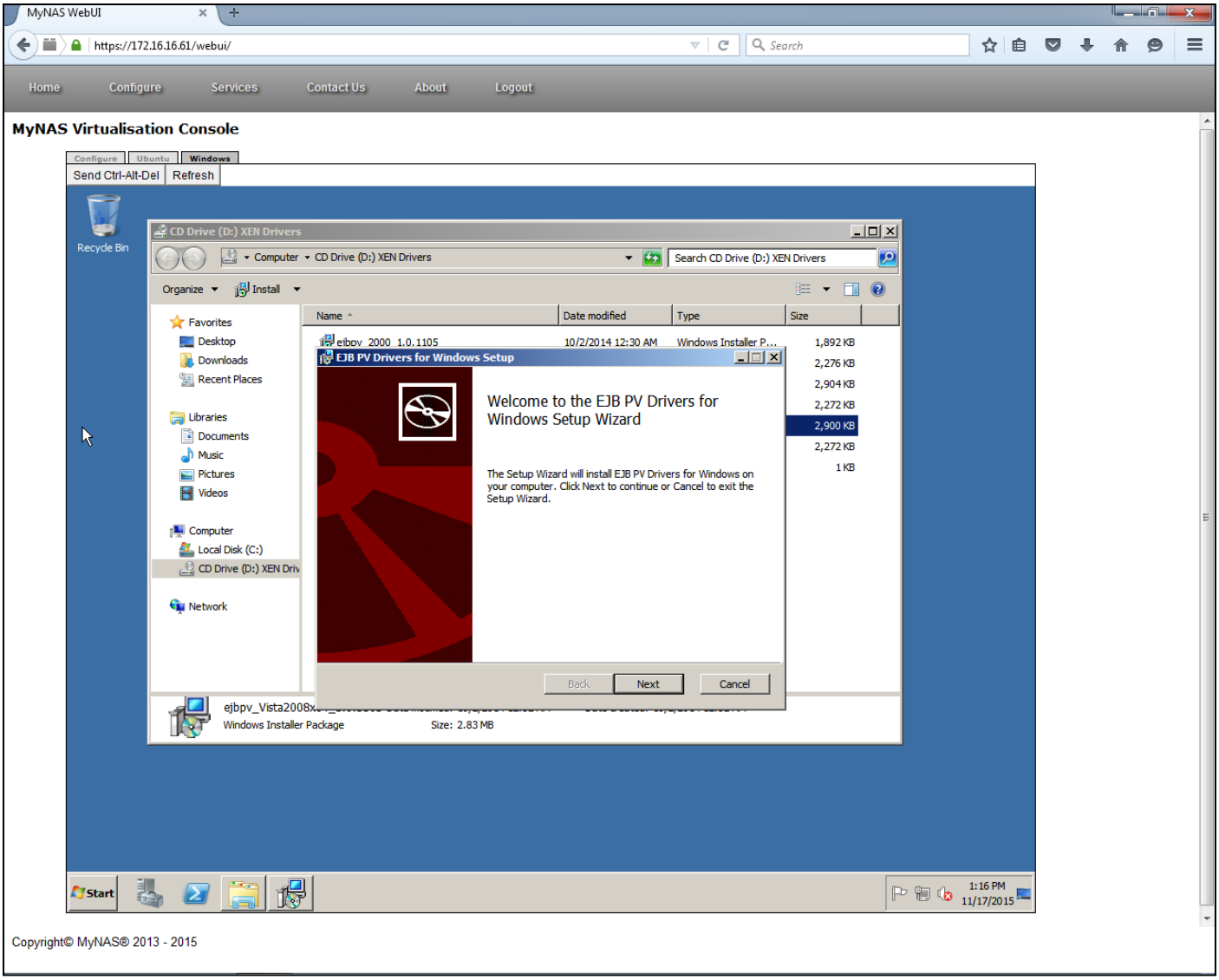
MyNAS will now process the request, and load the drivers into the selected Windows virtual machine



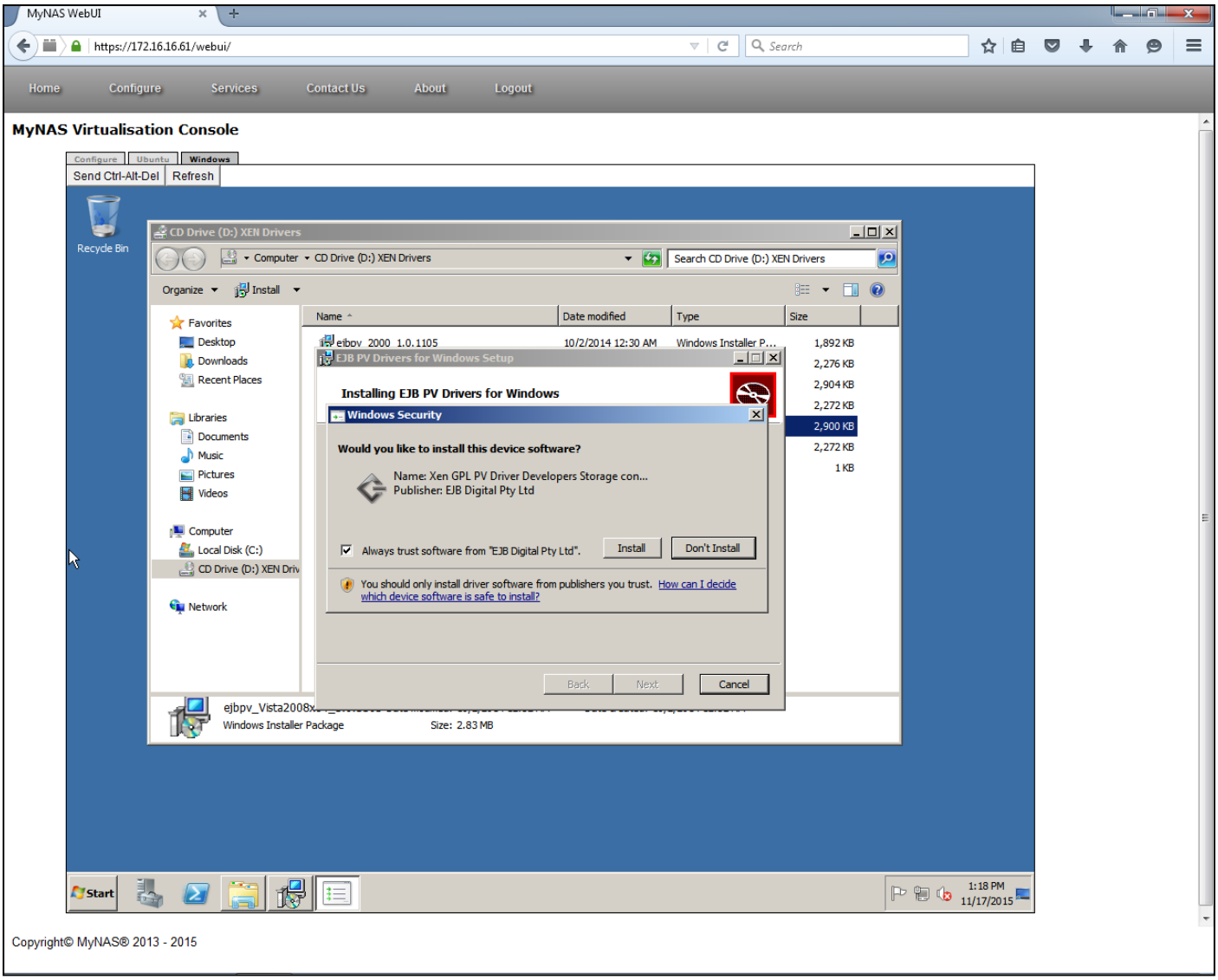
Go back to the selected Windows virtual machine, and the Xen Drivers ISO will be loaded



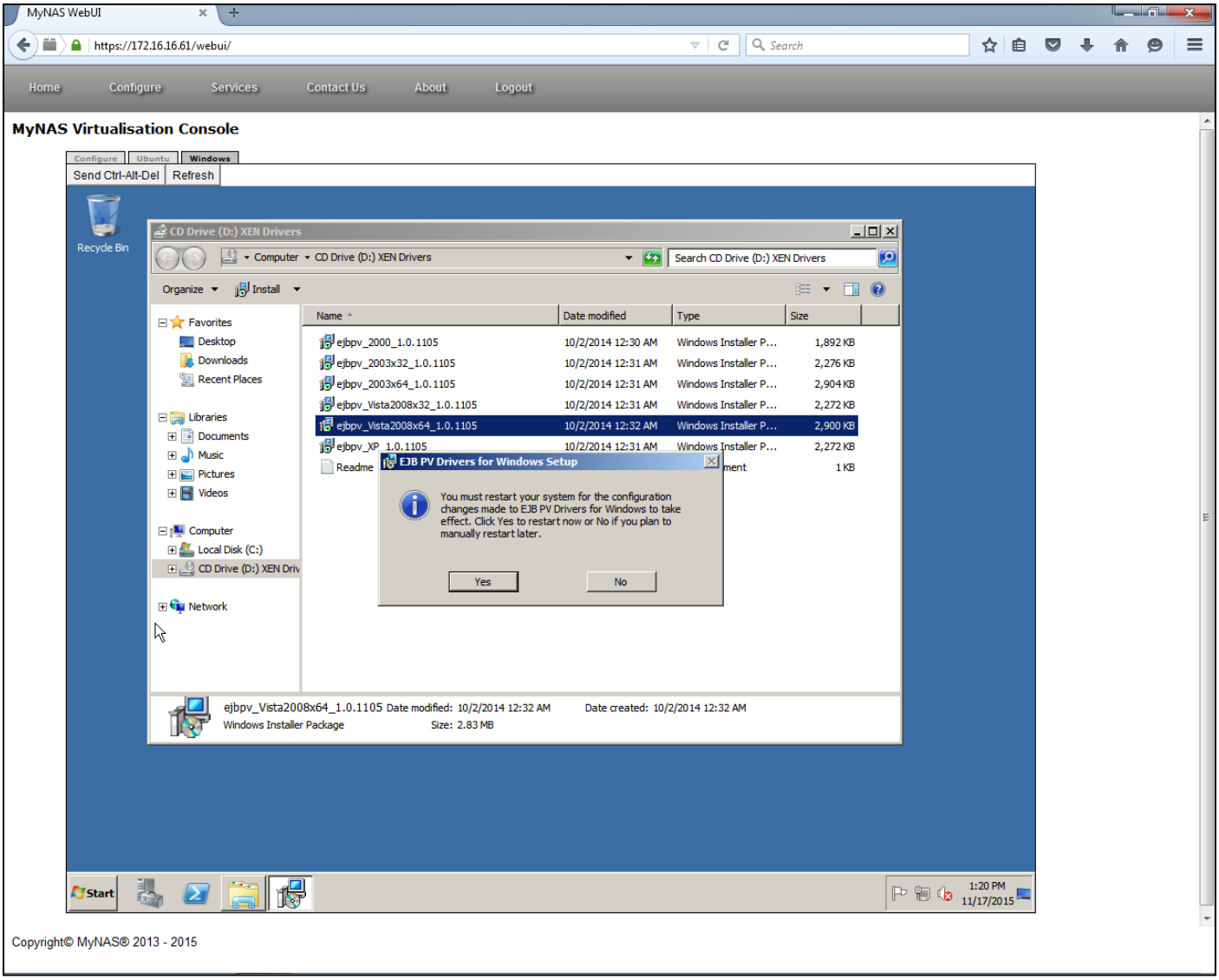
Depending on the version of Windows, load the appropriate driver package



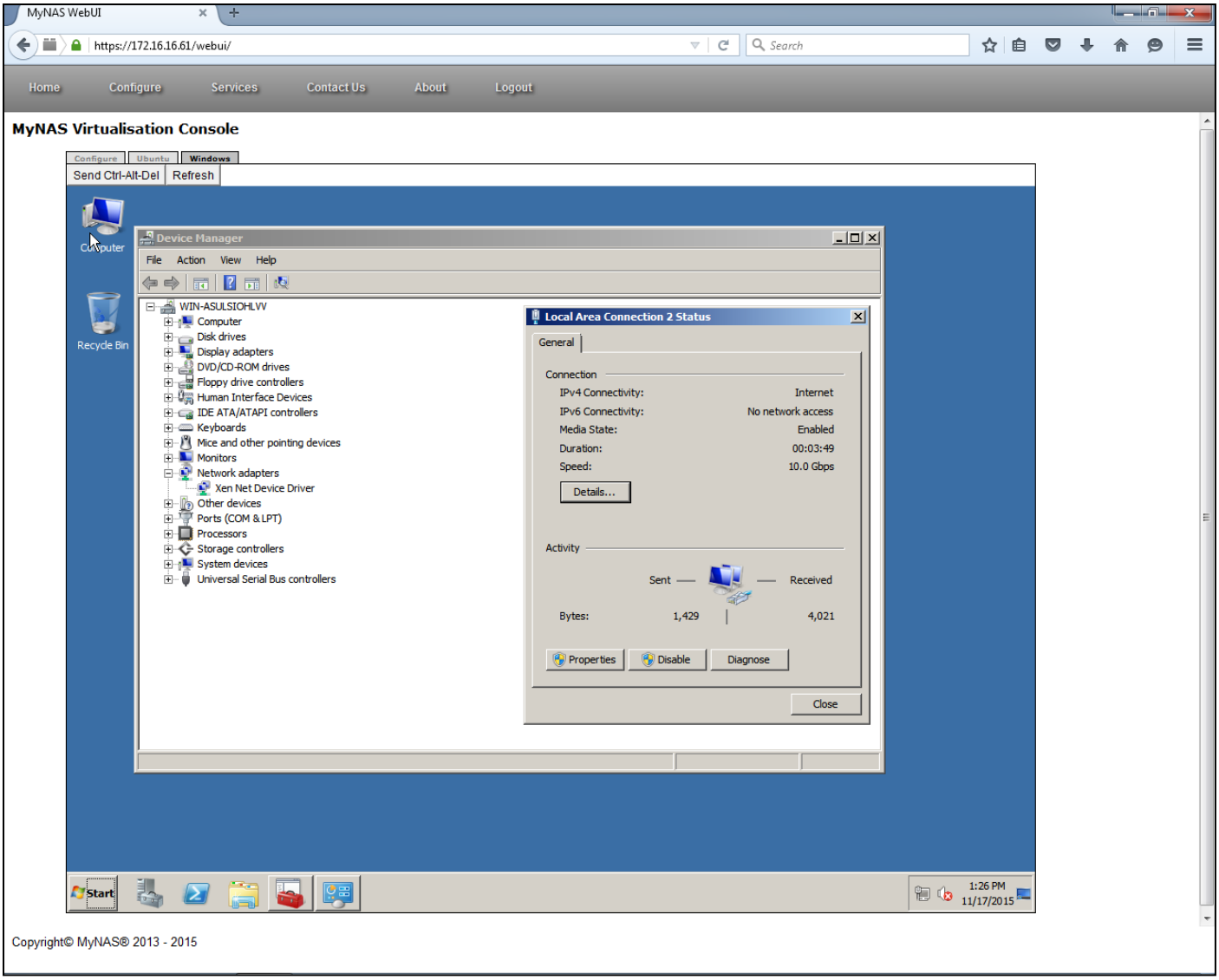
Click through the driver installation, and select to install the 'Complete' program features when prompted.



During the installation, some of the drivers (depending on the operating system) may prompt about the driver not passed the Windows Logo testing, or trusting the driver install from EJB Digital Pty Lt. Continue installing the driver.



Click Finish to complete the Xen Windows Driver installation. You will be prompted to reboot the system to ensure that the new Xen drivers are utilised by the Windows virtual machine.



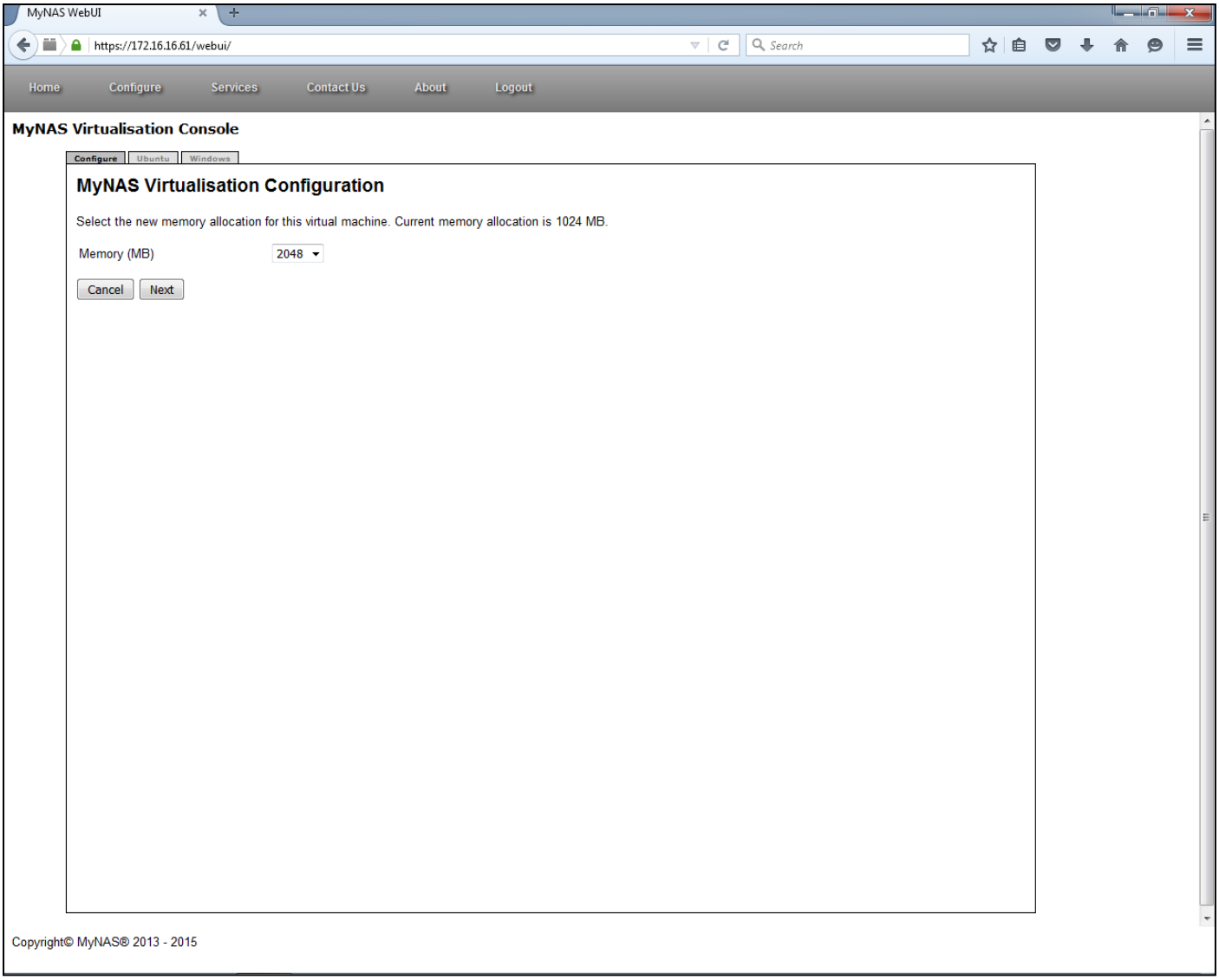
Once the Windows virtual machine is restarted, it will now be using the correct drivers for various system components such as the network card.

Modify a Virtual Machine Hardware

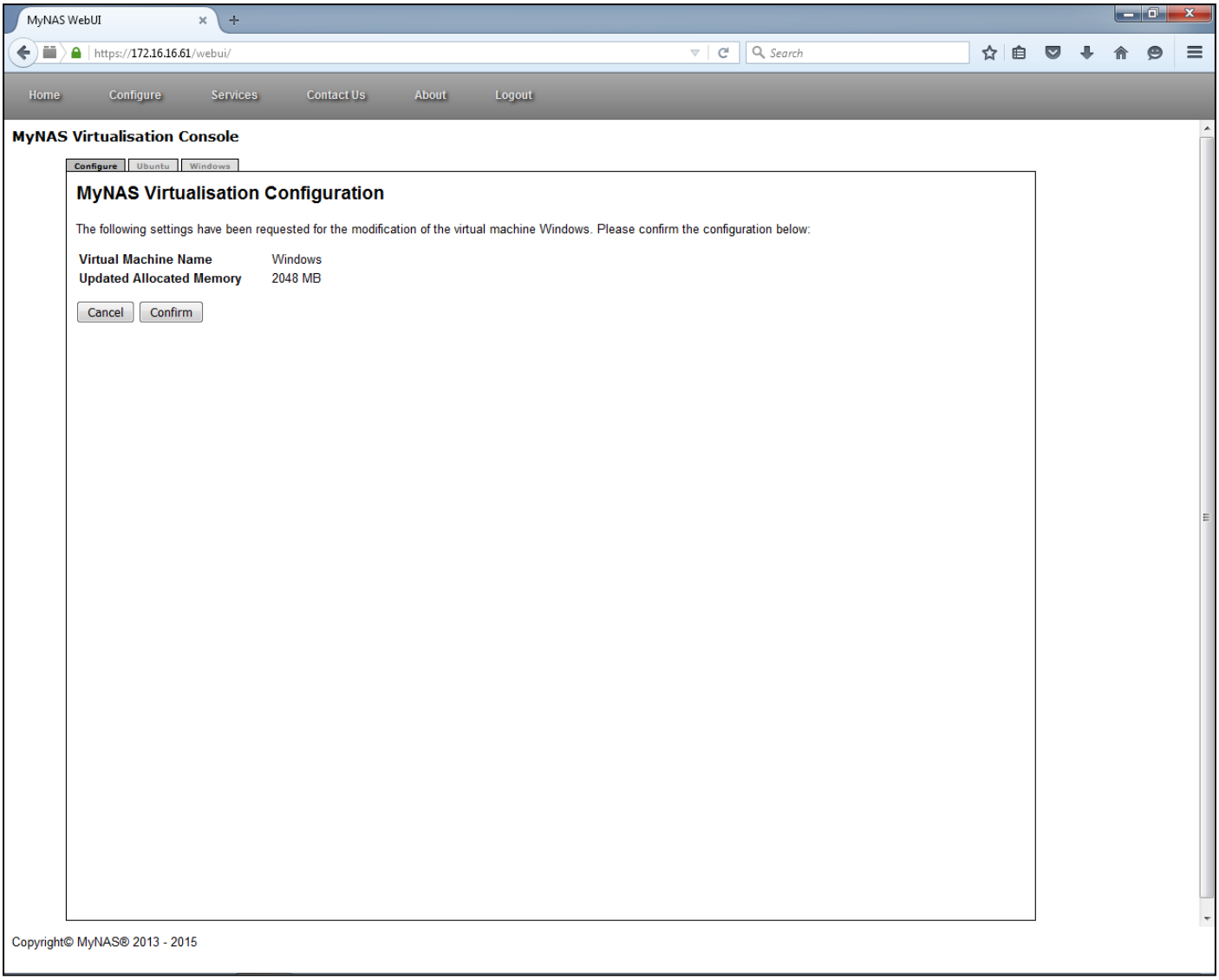
Modifying the virtual machine hardware allows you to increase or decrease the amount of memory assigned to a virtual machine.

Note: Any hardware change to a virtual machine can only be made whilst the virtual machine is powered off.

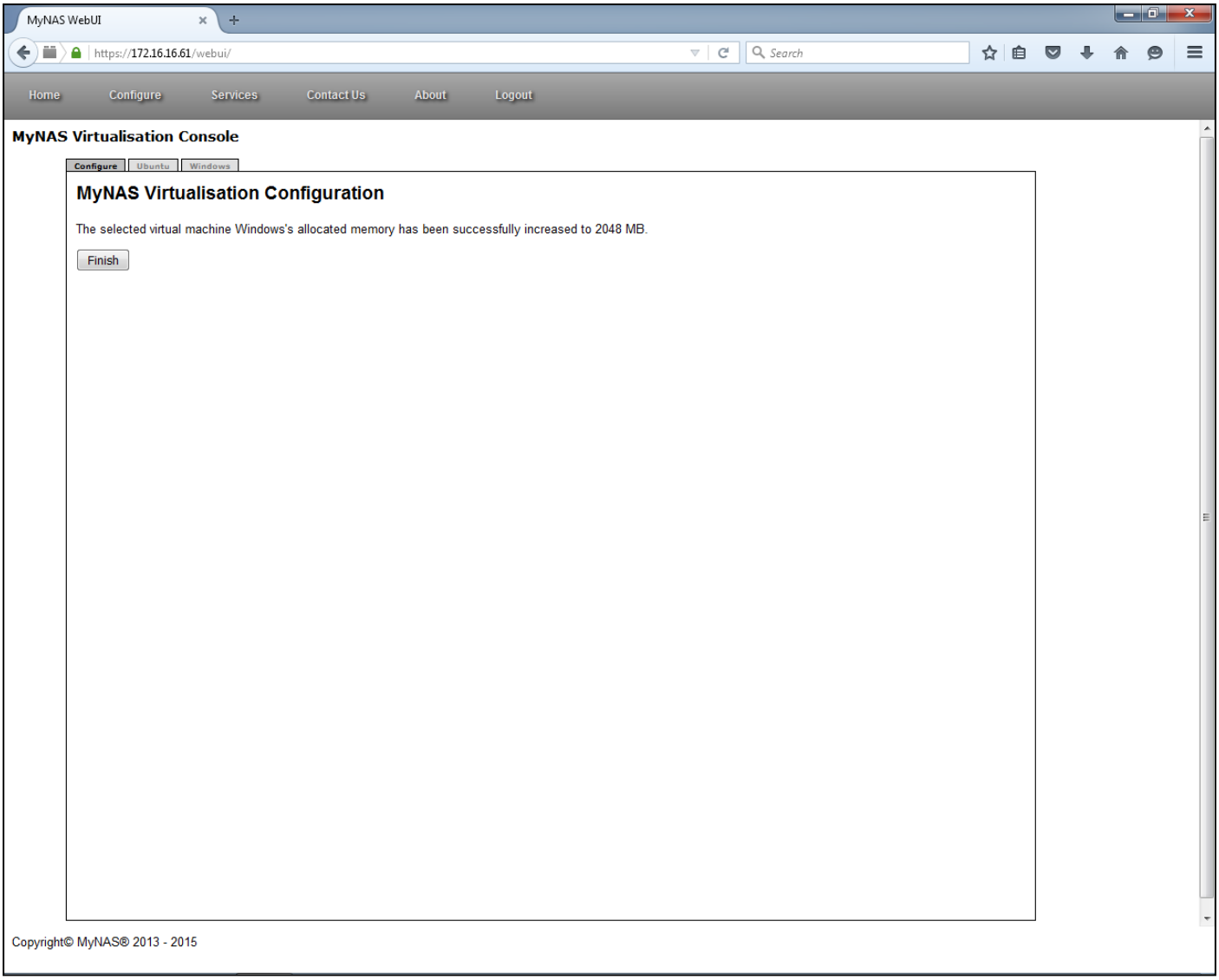
To change the memory allocation, click on the 'Modify Virtual Machine' button, and select the appropriate action for the specific virtual machine - in this case 'Modify Virtual Hardware' and click the Modify Virtual Machine for the respective system.



Select the new memory allocation for the virtual machine, and click 'Next'

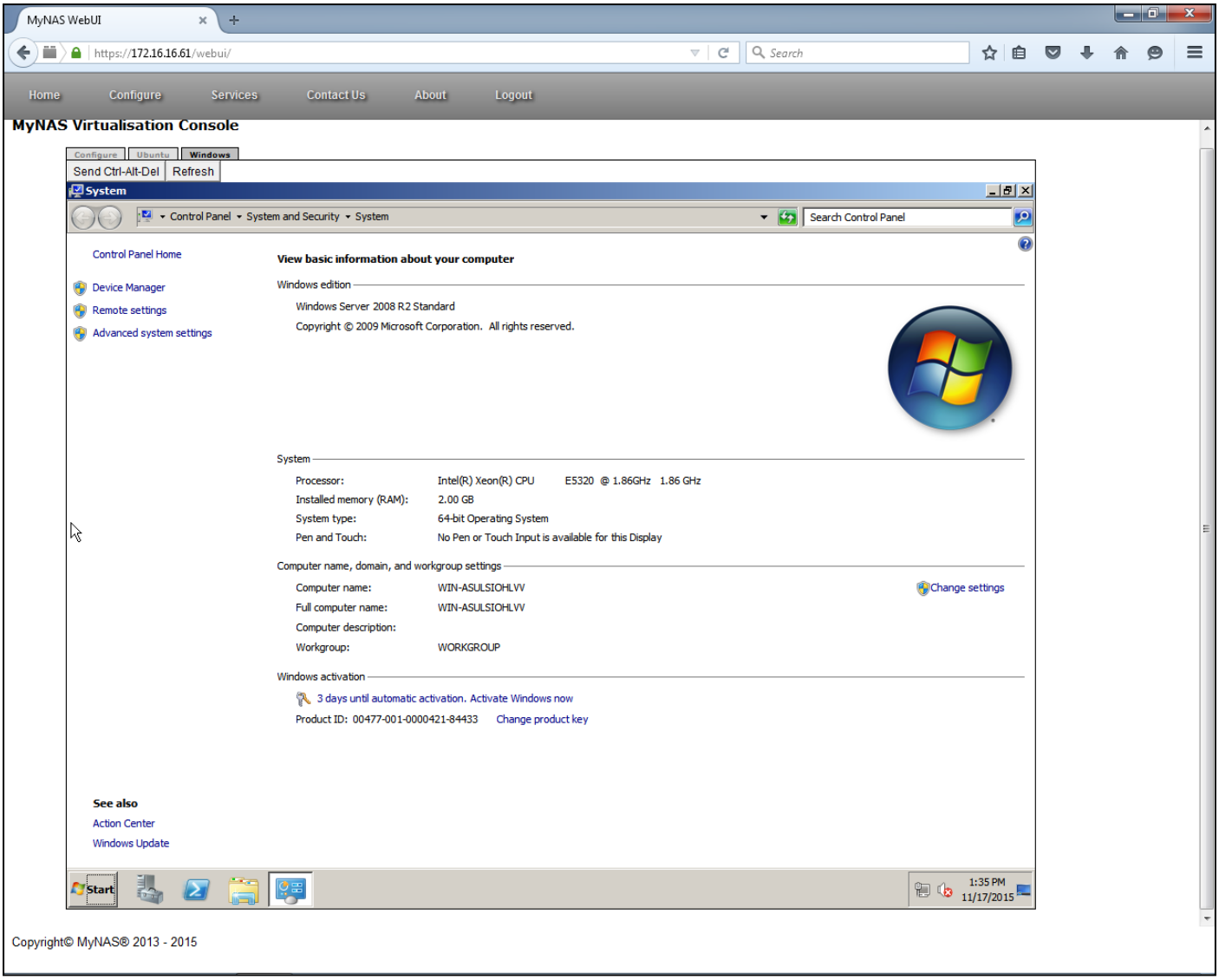


Confirm the new memory allocation and click 'Confirm'



MyNAS will now process the memory change for the selected virtual machine. Click Finish to complete the change.

Power on the virtual machine, and validate in the OS the change in system memory:


MyNAS WebUI
https://172.16.16.61/webui/
Search
Home
Configure
Services
Contact Us
About
Logout
MyNAS Virtualisation Console
Configure
Ubuntu
Windows
Send Ctrl-Alt-Del
Refresh
System
Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
Advanced system settings
View basic information about your computer
Windows edition
Windows Server 2008 R2 Standard
Copyright © 2009 Microsoft Corporation. All rights reserved.
System
Processor: Intel(R) Xeon(R) CPU E5320 @ 1.86GHz 1.86 GHz
Installed memory (RAM): 2.00 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: WIN-ASULSIOHLVV
Change settings
Full computer name: WIN-ASULSIOHLVV
Computer description:
Workgroup: WORKGROUP
Windows activation
3 days until automatic activation. Activate Windows now
Product ID: 00477-001-0000421-84433
Change product key
See also
Action Center
Windows Update
Start
1:35 PM
11/17/2015
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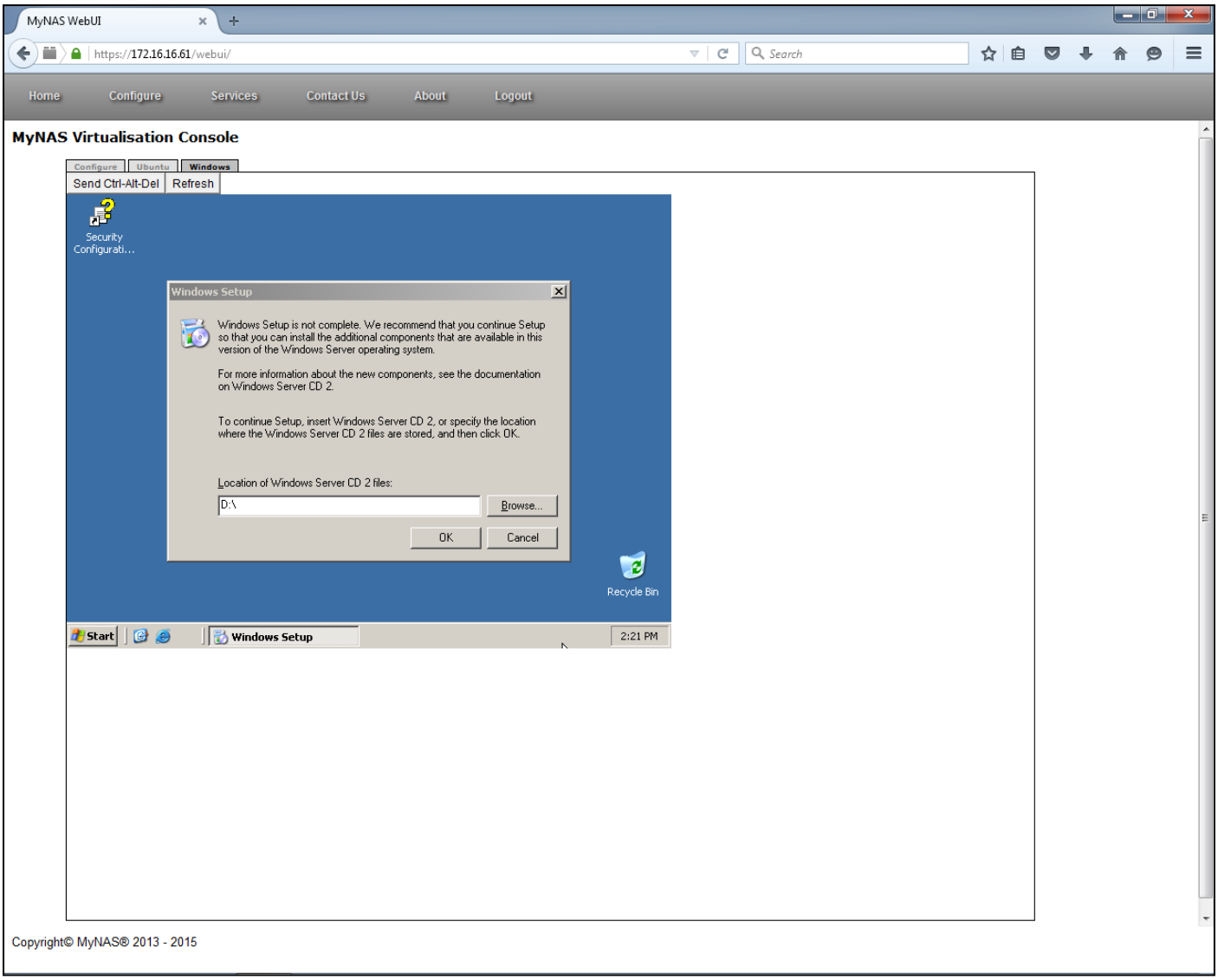
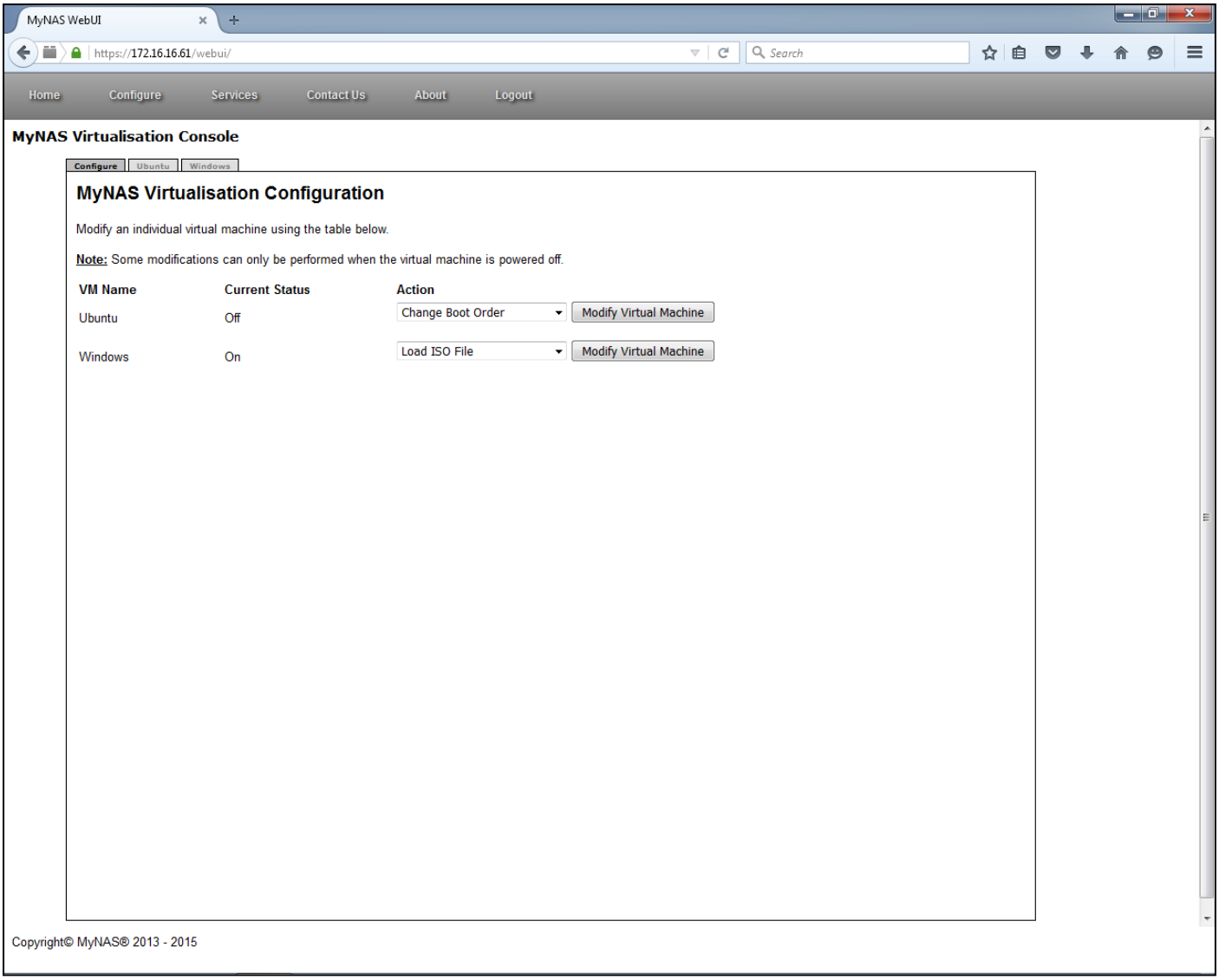
Load an additional ISO into the Virtual Machine

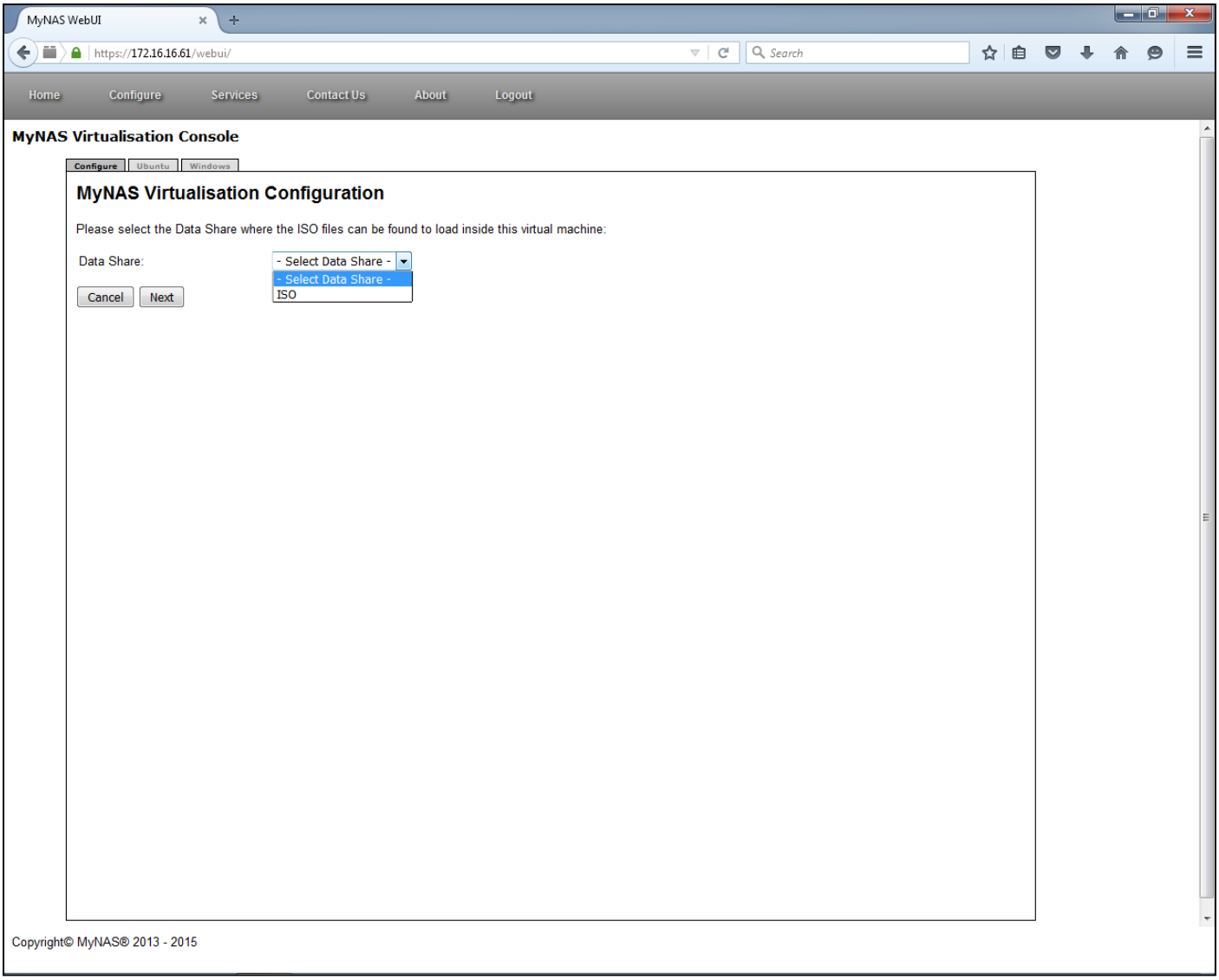
Depending on the operating system selected to install, it may be necessary to load an additional ISO file to complete the operating system installation. Most notably, Microsoft Windows 2003 R2 had this requirement as illustrated below:



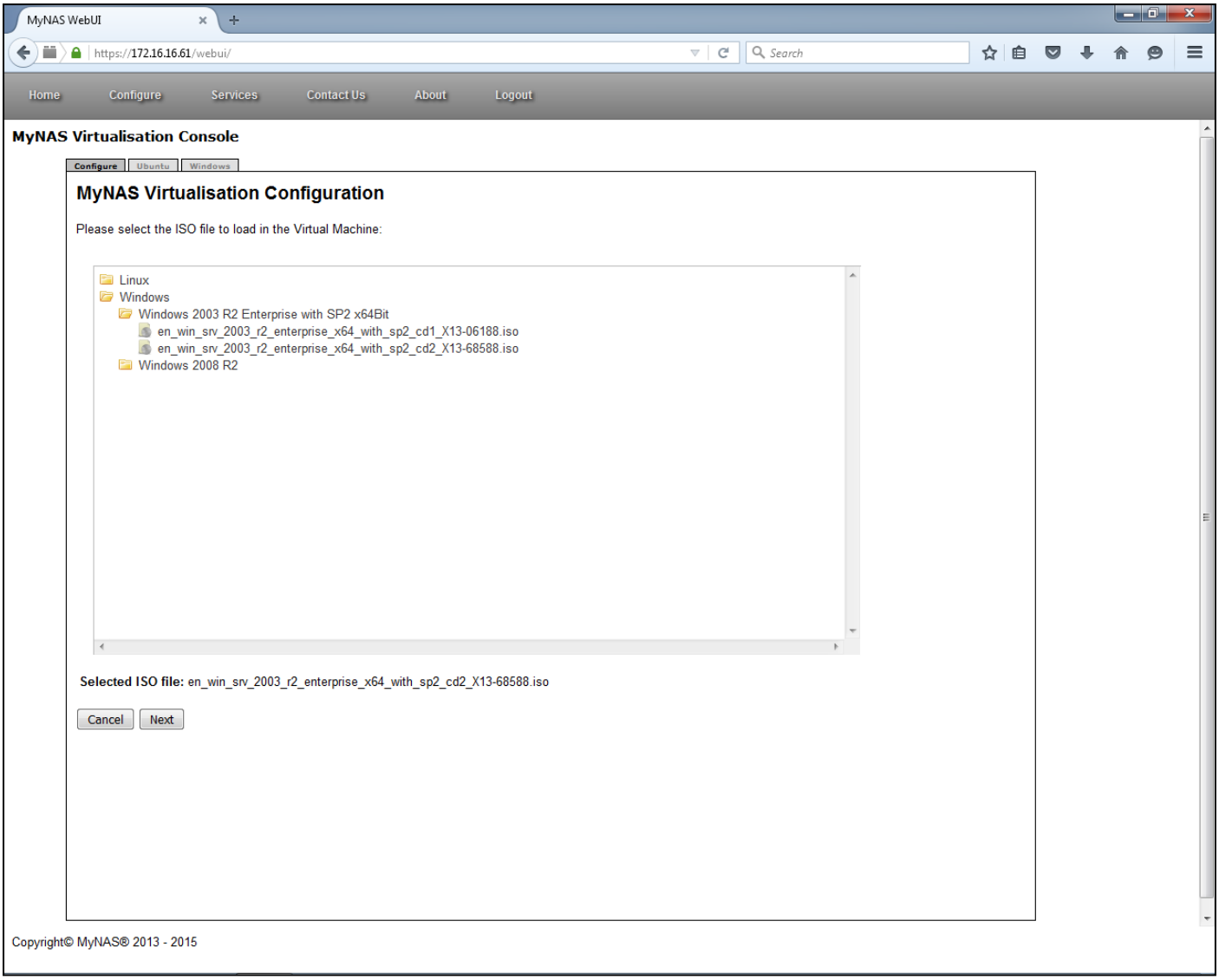
To load the second ISO to complete the installation, click on the 'Modify Virtual Machine' button, and select the appropriate action for the specific virtual machine - in this case 'Load ISO File'



Click the 'Modify Virtual Machine' button for the Windows Virtual Machine to continue

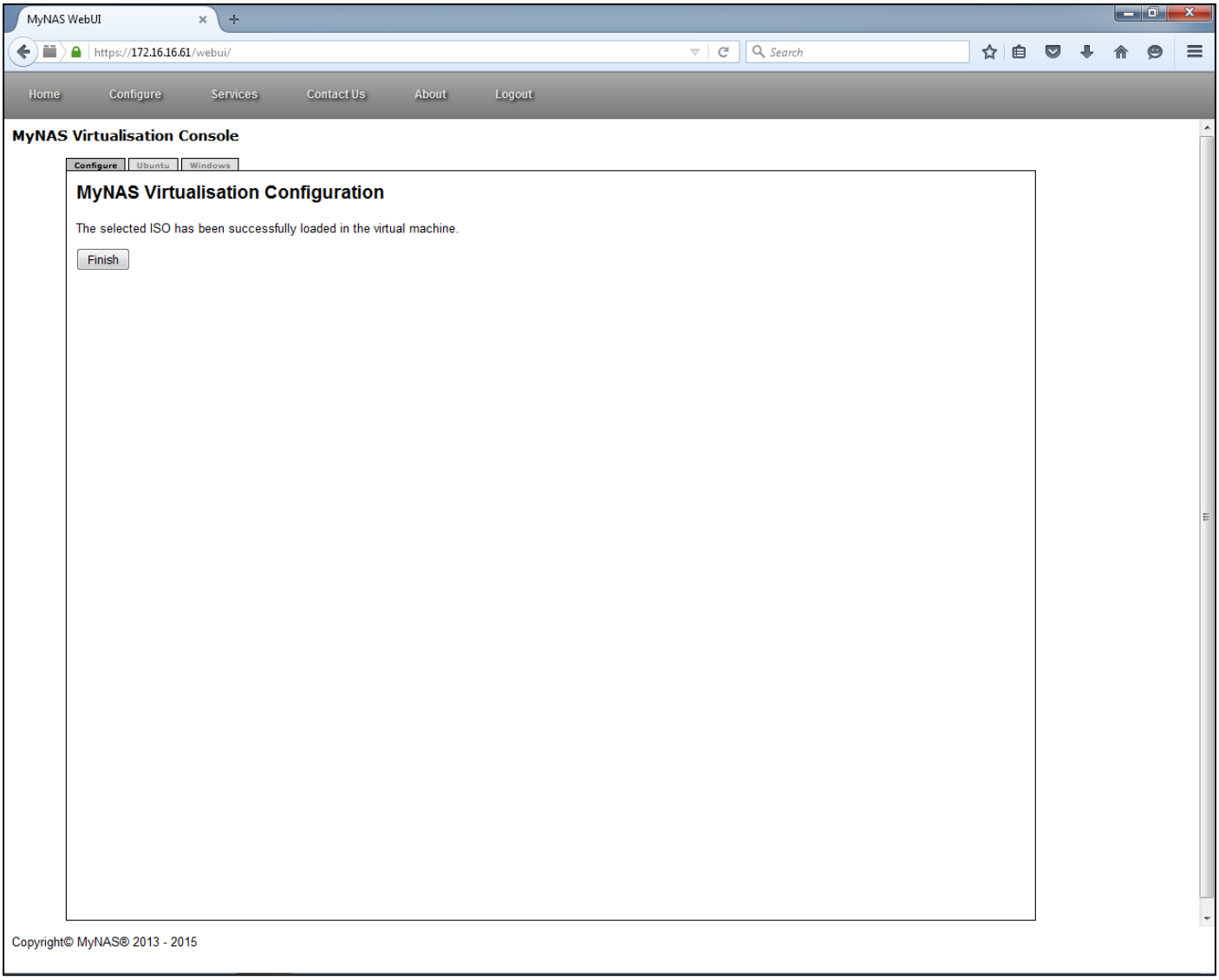


Select the appropriate Data Share for the ISO file, and click 'Next'

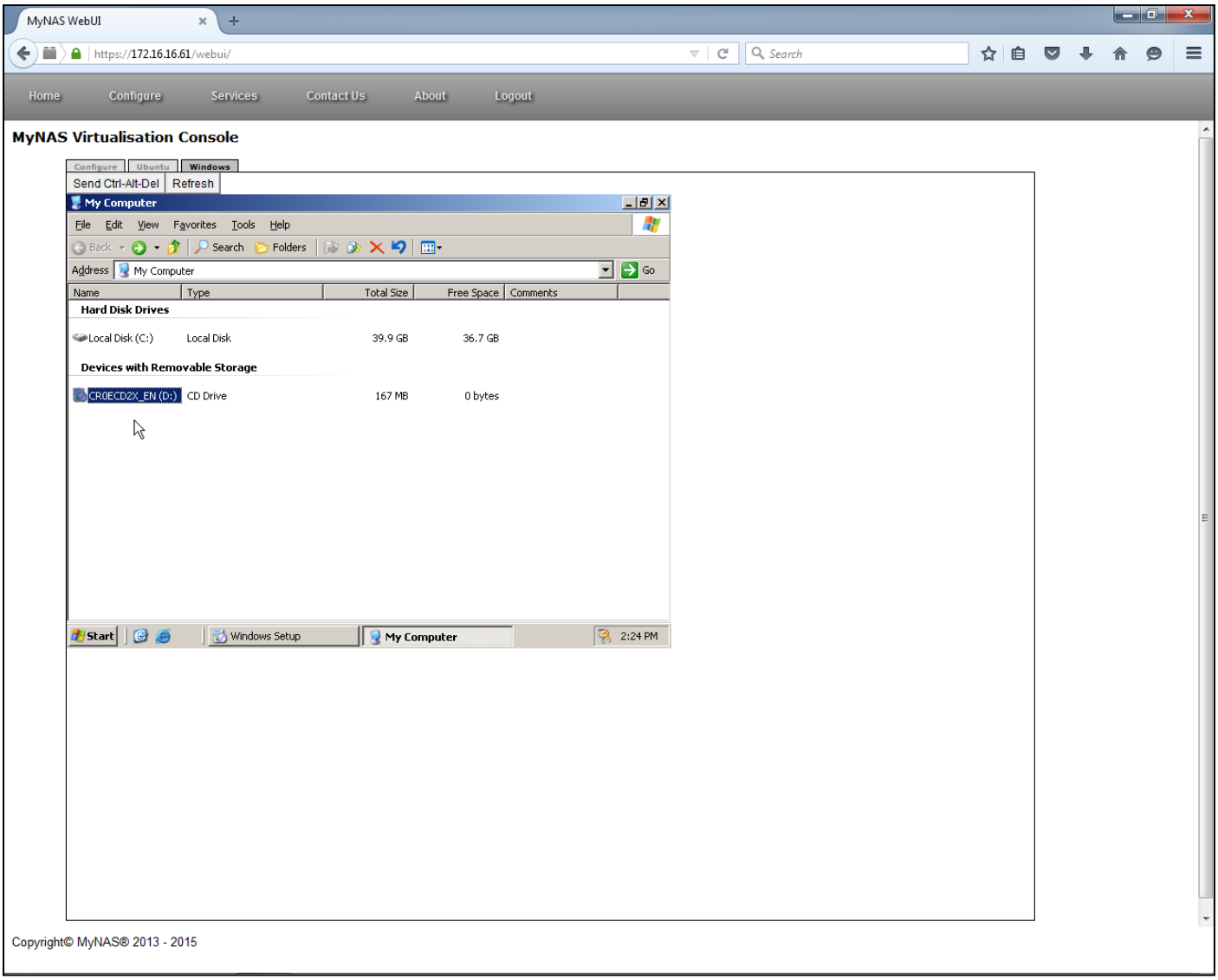


Double click the appropriate ISO file - in this case 'cd2' for the 2003 R2 installation. Click 'Next' to continue.

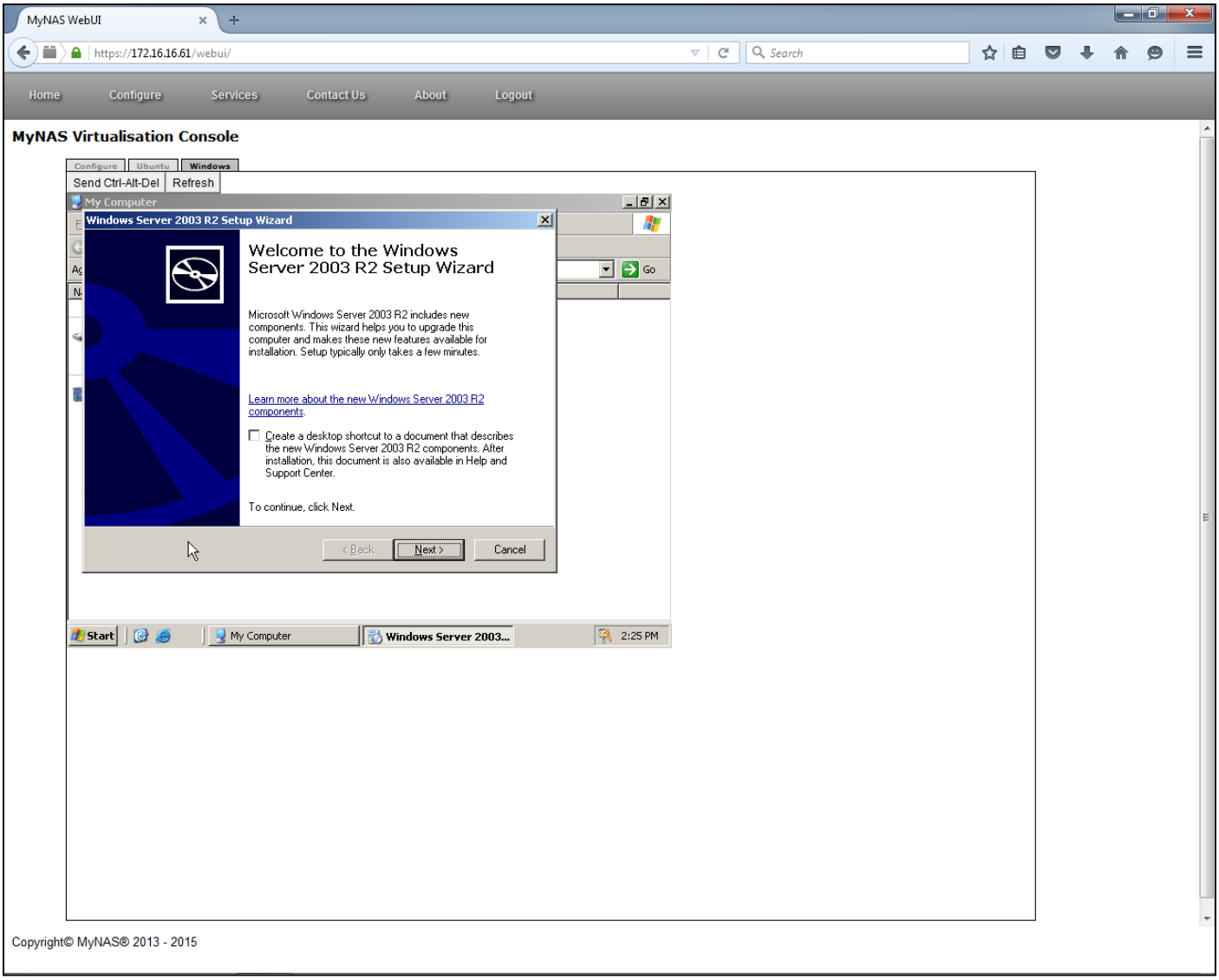
The selected ISO file will now be loaded into the virtual machine.



Click Finish, and go back to the virtual machine by clicking on the virtual machine tab to verify that the new ISO has loaded



Continue the installation of the operating system as required.


MyNAS WebUI
https://172.16.16.61/webui/
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Logout
MyNAS Virtualisation Console
Configure
Ubuntu
Windows
Send Ctrl-Alt-Del
Refresh
My Computer
Windows Server 2003 R2 Setup Wizard
Welcome to the Windows Server 2003 R2 Setup Wizard
Microsoft Windows Server 2003 R2 includes new components. This wizard helps you to upgrade this computer and makes these new features available for installation. Setup typically only takes a few minutes.
Learn more about the new Windows Server 2003 R2 components.
Create a desktop shortcut to a document that describes the new Windows Server 2003 R2 components. After installation, this document is also available in Help and Support Center.
To continue, click Next.
< Back
Next >
Cancel
Go
Start
My Computer
Windows Server 2003...
2:25 PM
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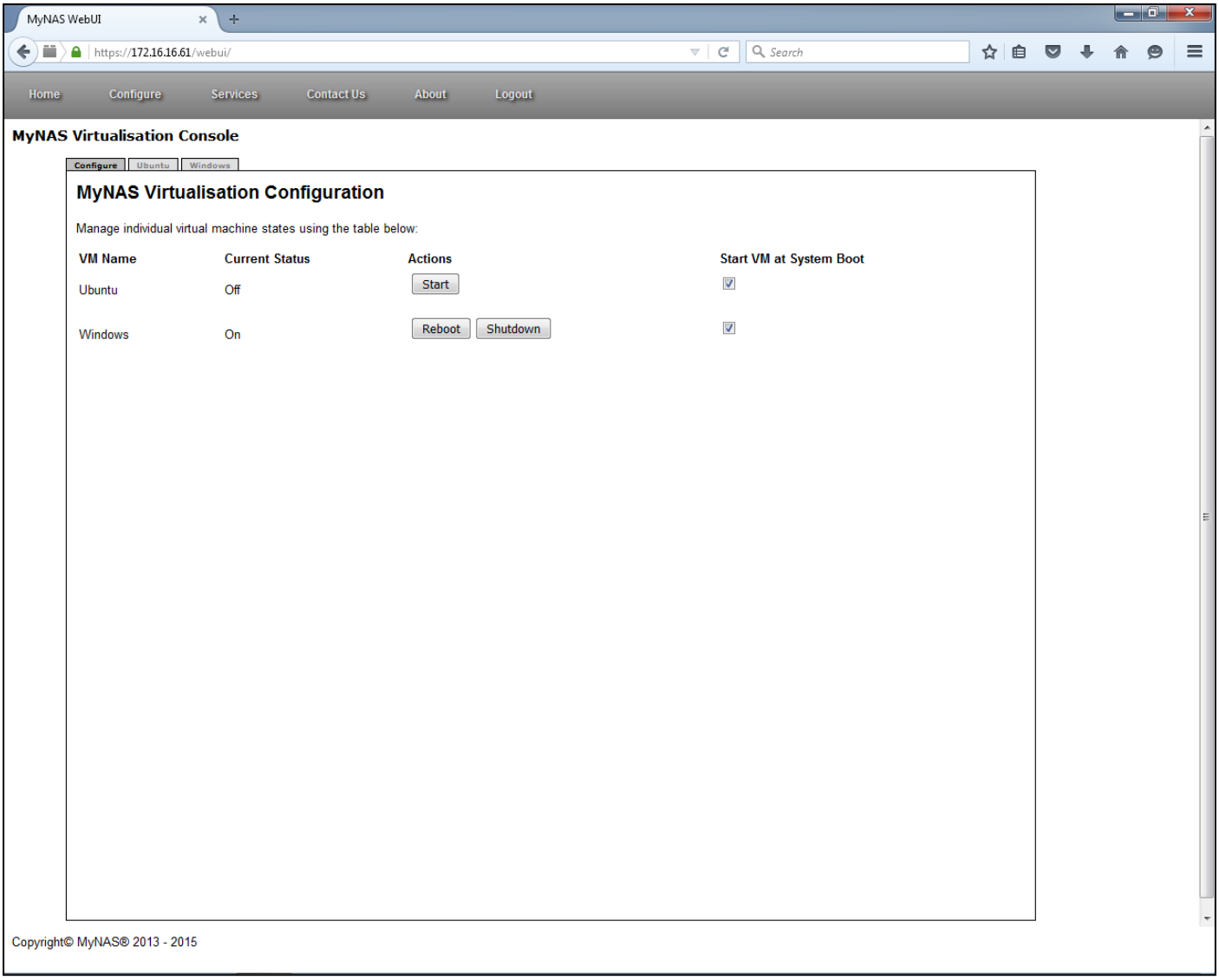
Manage Virtual Machine status

Managing a virtual machine status allows the machine to be started, rebooted or shutdown. It also allows to specify whether to start that particular virtual machine at boot time.



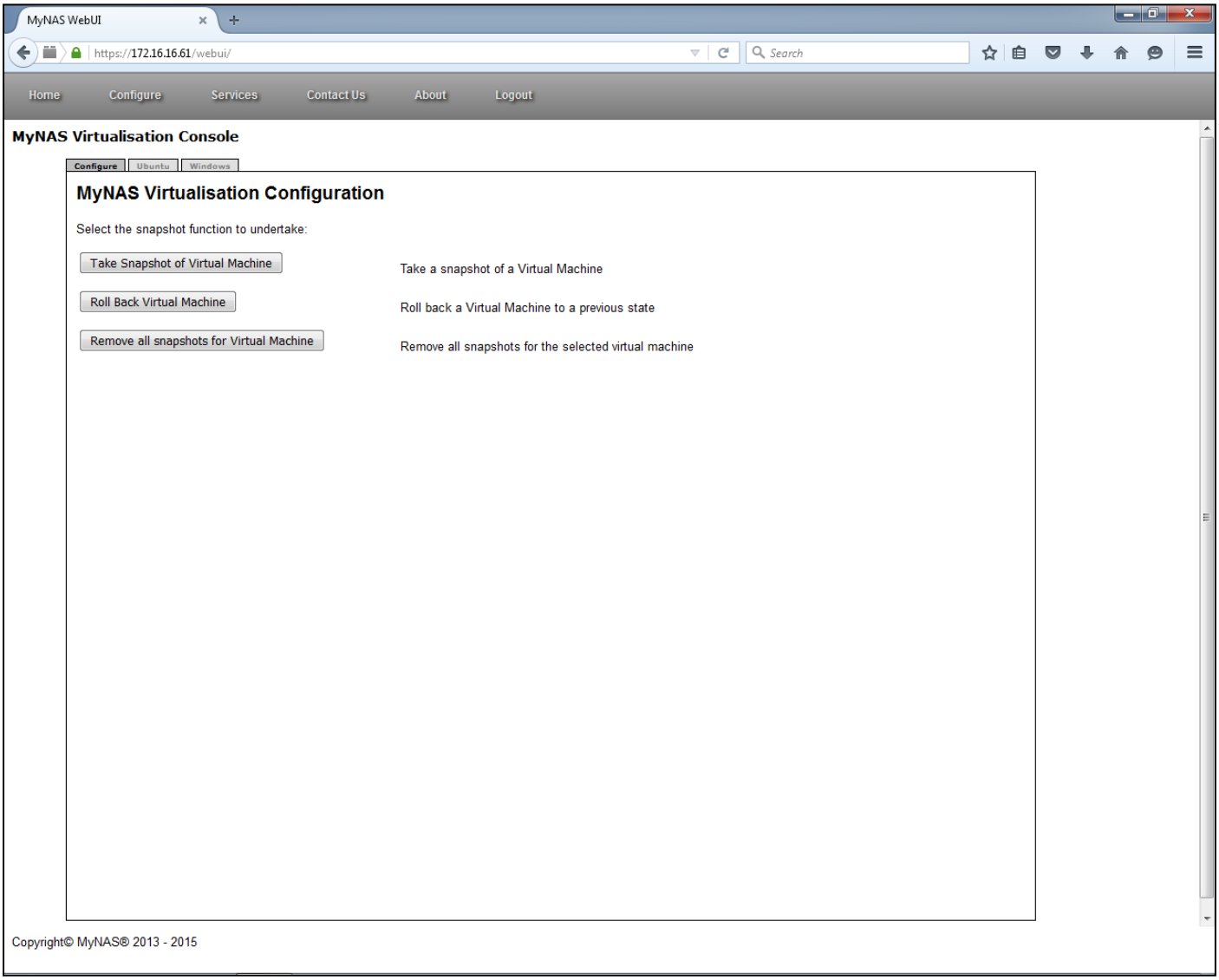
To change the status of a virtual machine, click on the respective button or check box to action the request.

Snapshot a Virtual Machine

Snapshotting a virtual machine allows you to roll back to a specific point in time for that specific virtual machine.

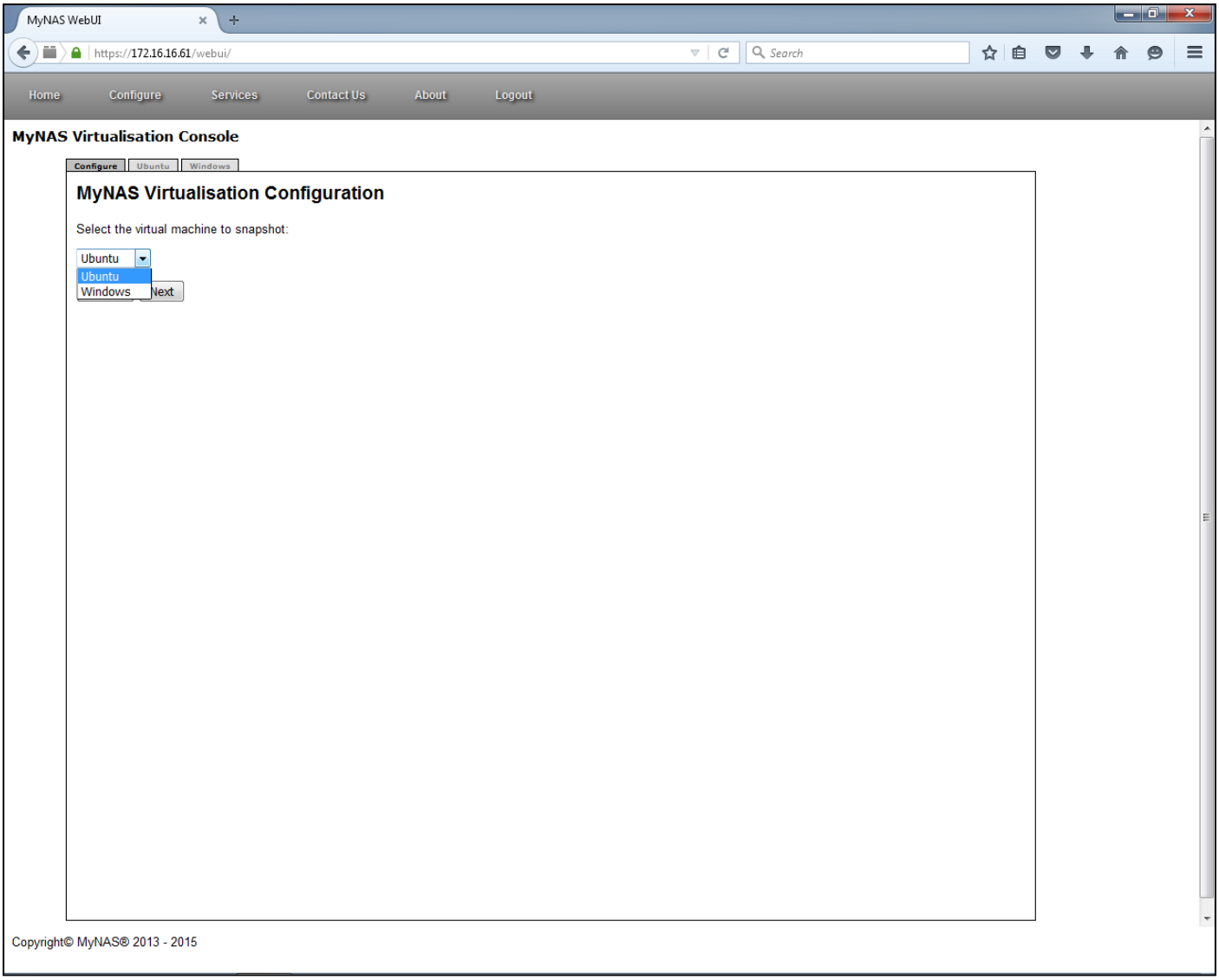
Note: To snapshot a virtual machine, it must first be in a shutdown state.

To snapshot a virtual machine, click on the 'Manage Snapshot' button for the following options

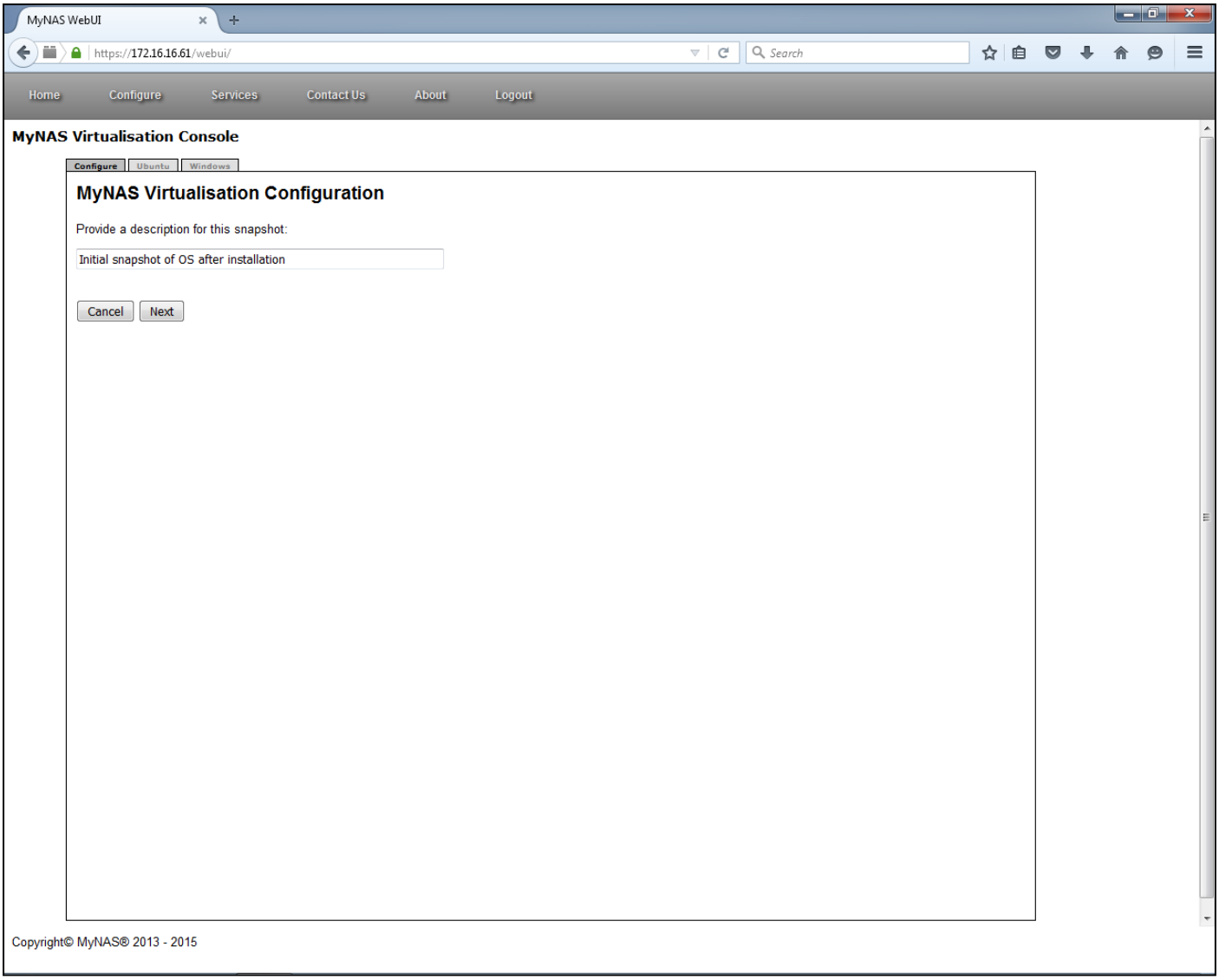


Take a snapshot

To take a snapshot, click on the 'Take Snapshot of Virtual Machine' button.

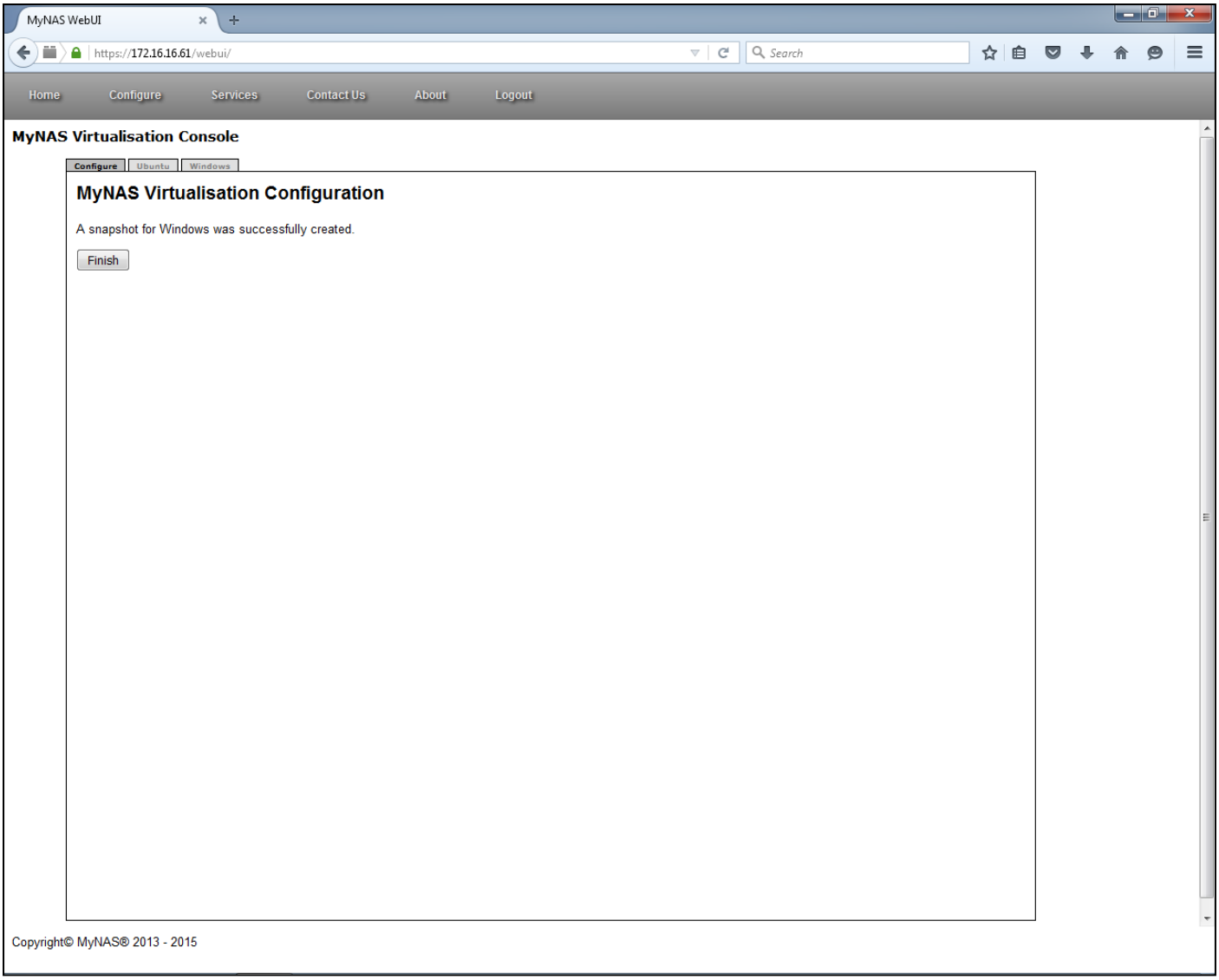


Select the respective virtual machine, and click 'Next'



Give the snapshot an appropriate description. Click 'Next'

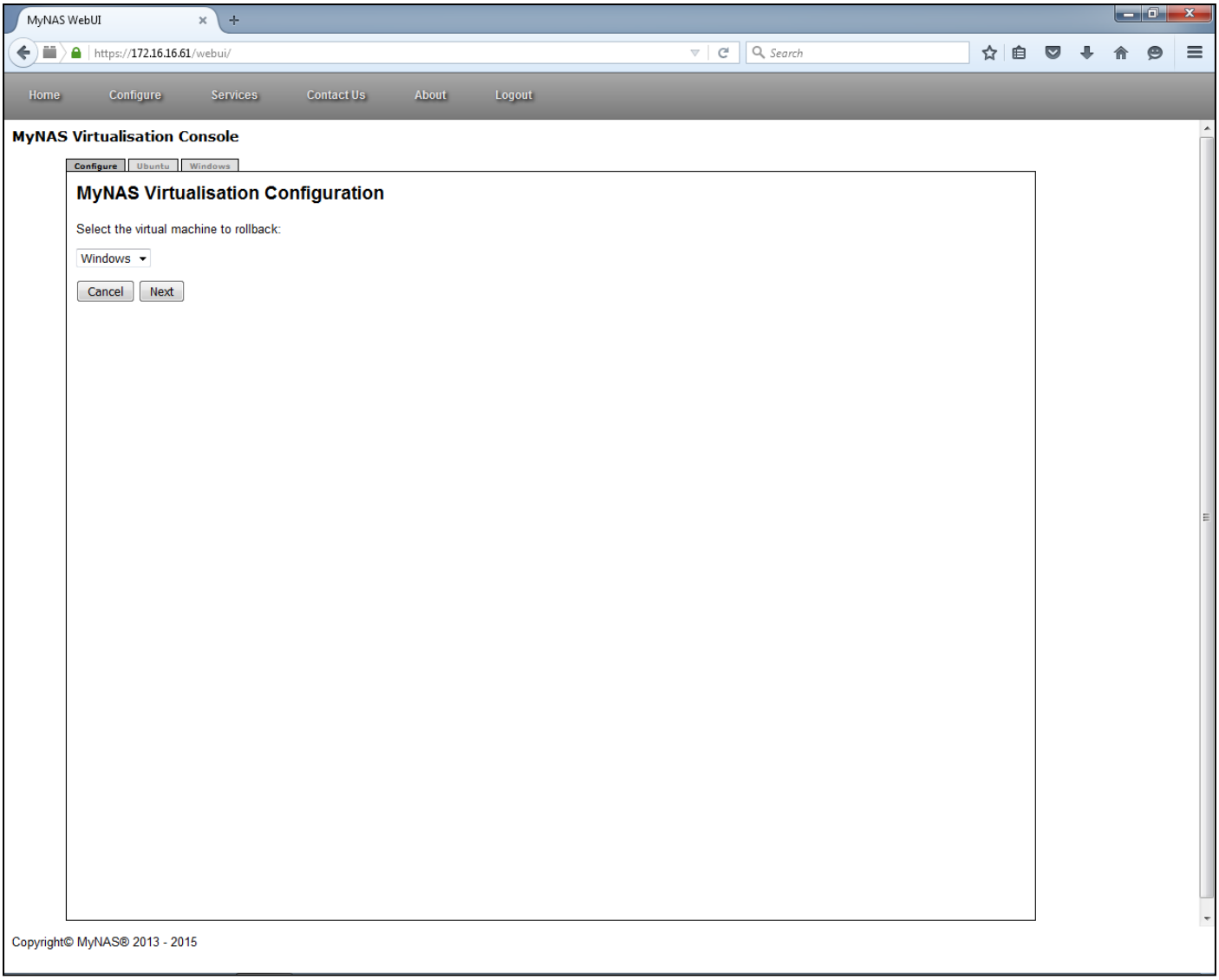
A snapshot will now be created for the virtual machine



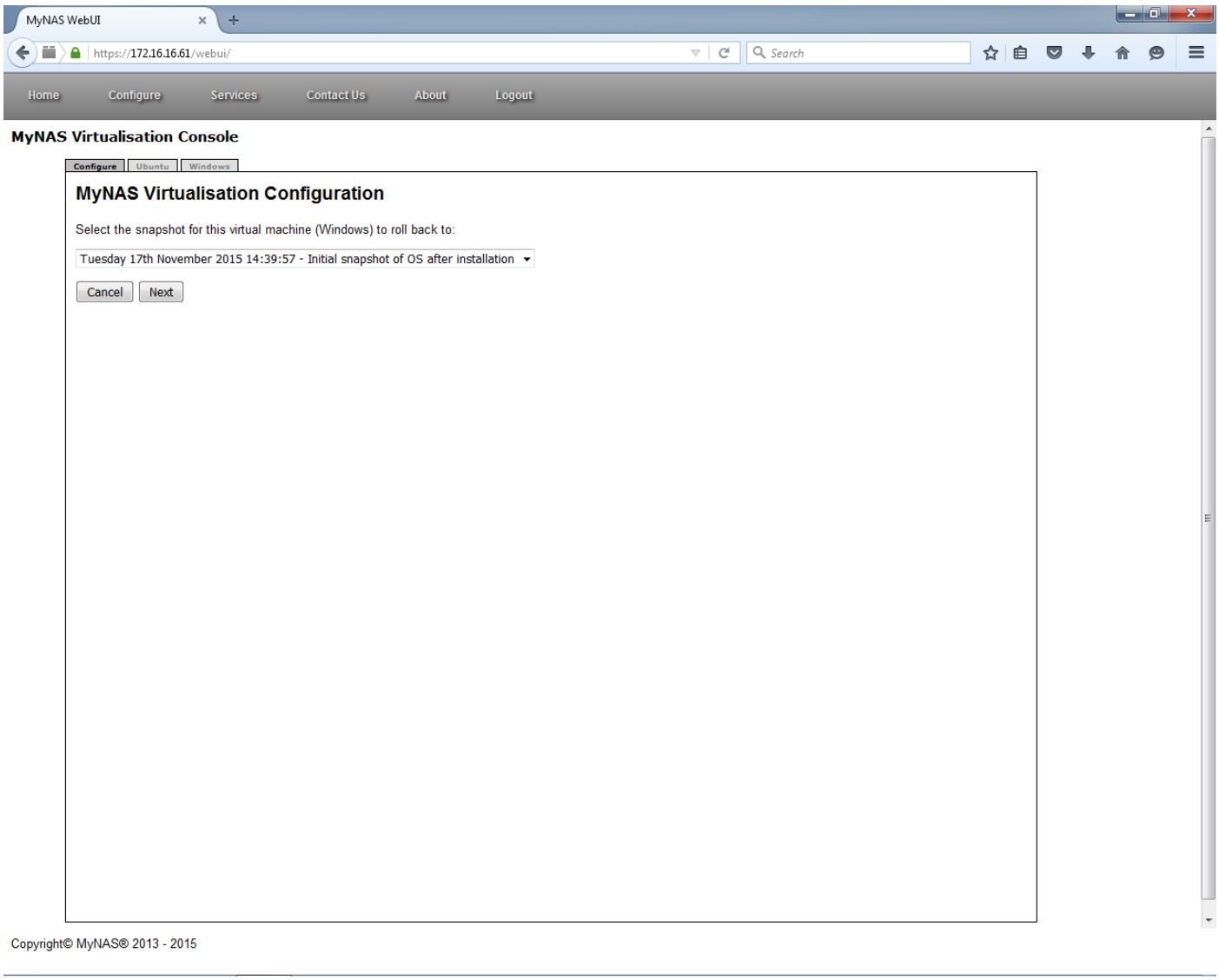
Click finish to complete the process. Power on the virtual machine if required

Roll back to a specific snapshot

To roll back to a snapshot, click on the 'Roll Back Virtual Machine' button



Select the appropriate virtual machine to roll back, and click 'Next'.


MyNAS WebUI
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Search
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MyNAS Virtualisation Console
Configure
Ubuntu
Windows
MyNAS Virtualisation Configuration
Select the snapshot for this virtual machine (Windows) to roll back to:
Tuesday 17th November 2015 14:39:57 - Initial snapshot of OS after installation
Cancel
Next
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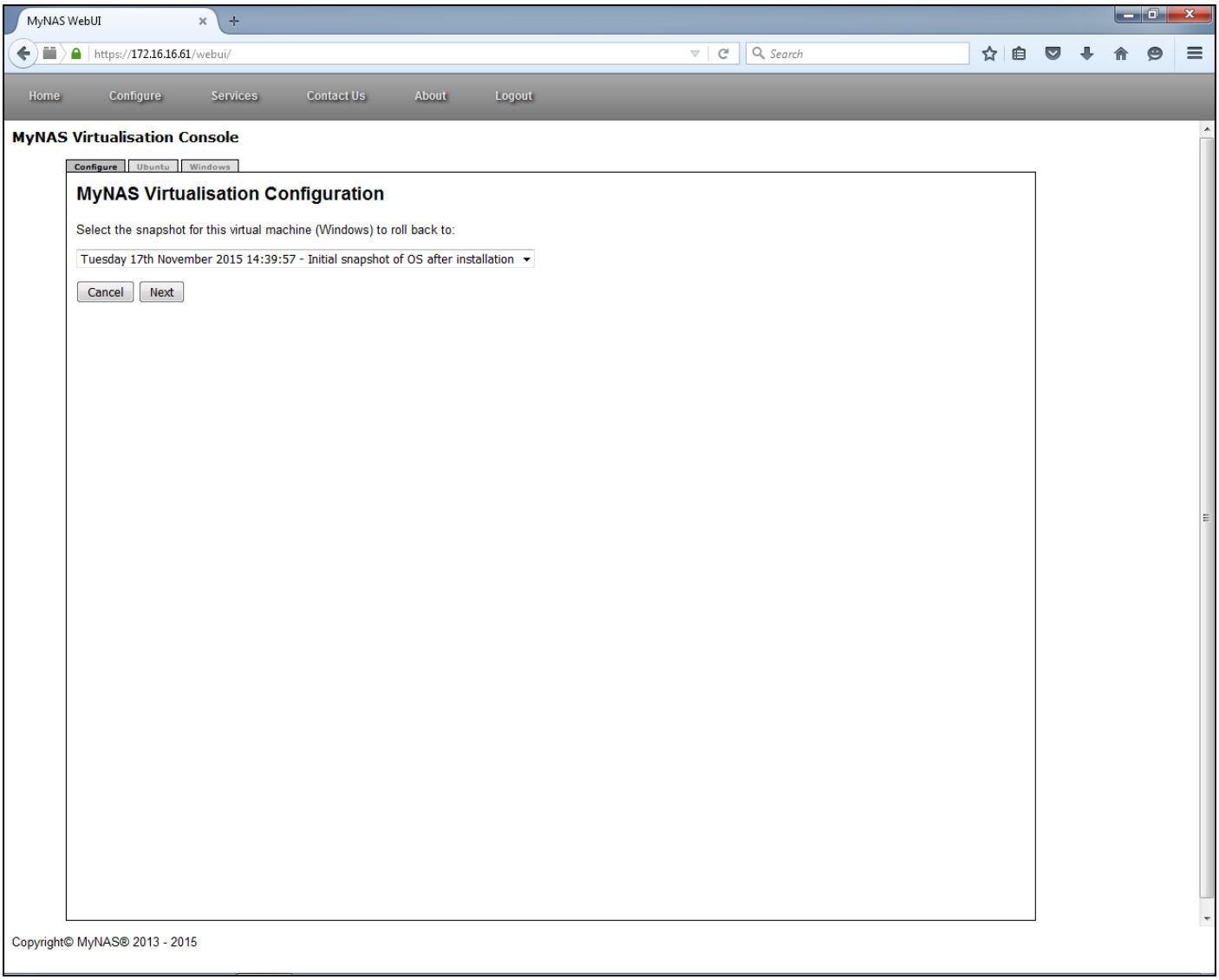
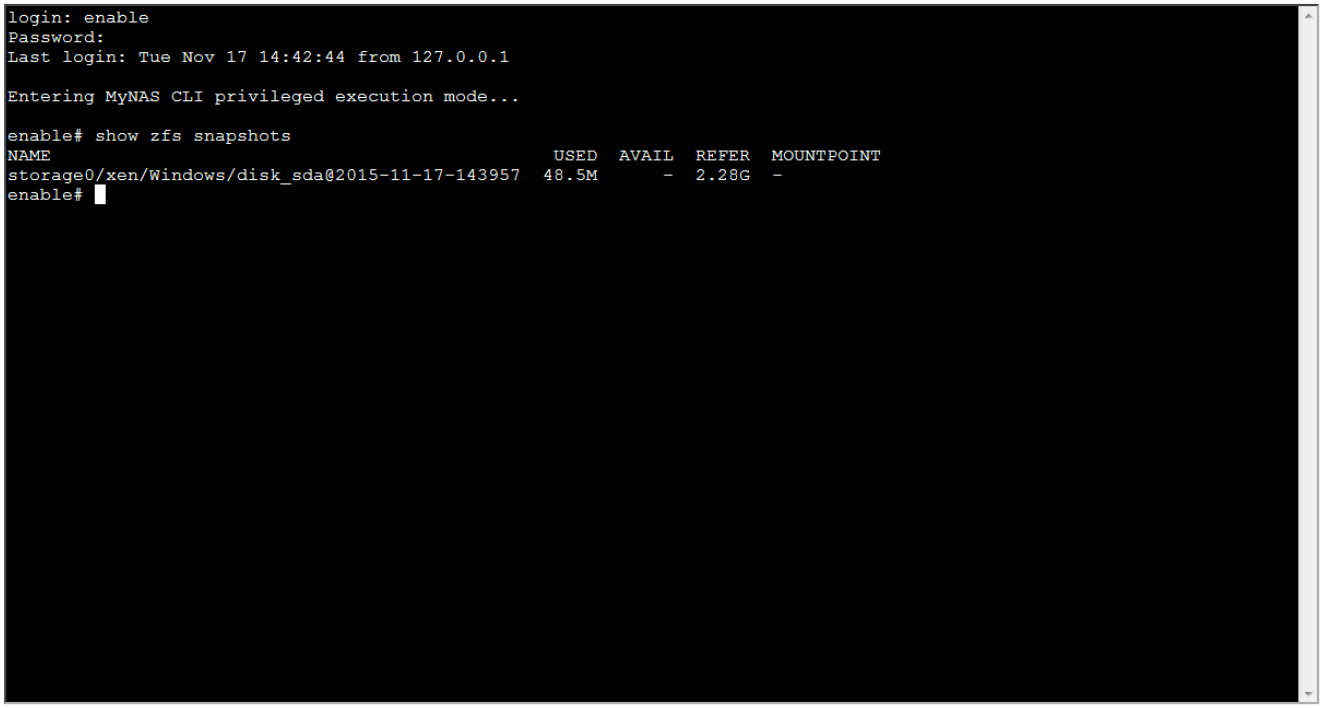
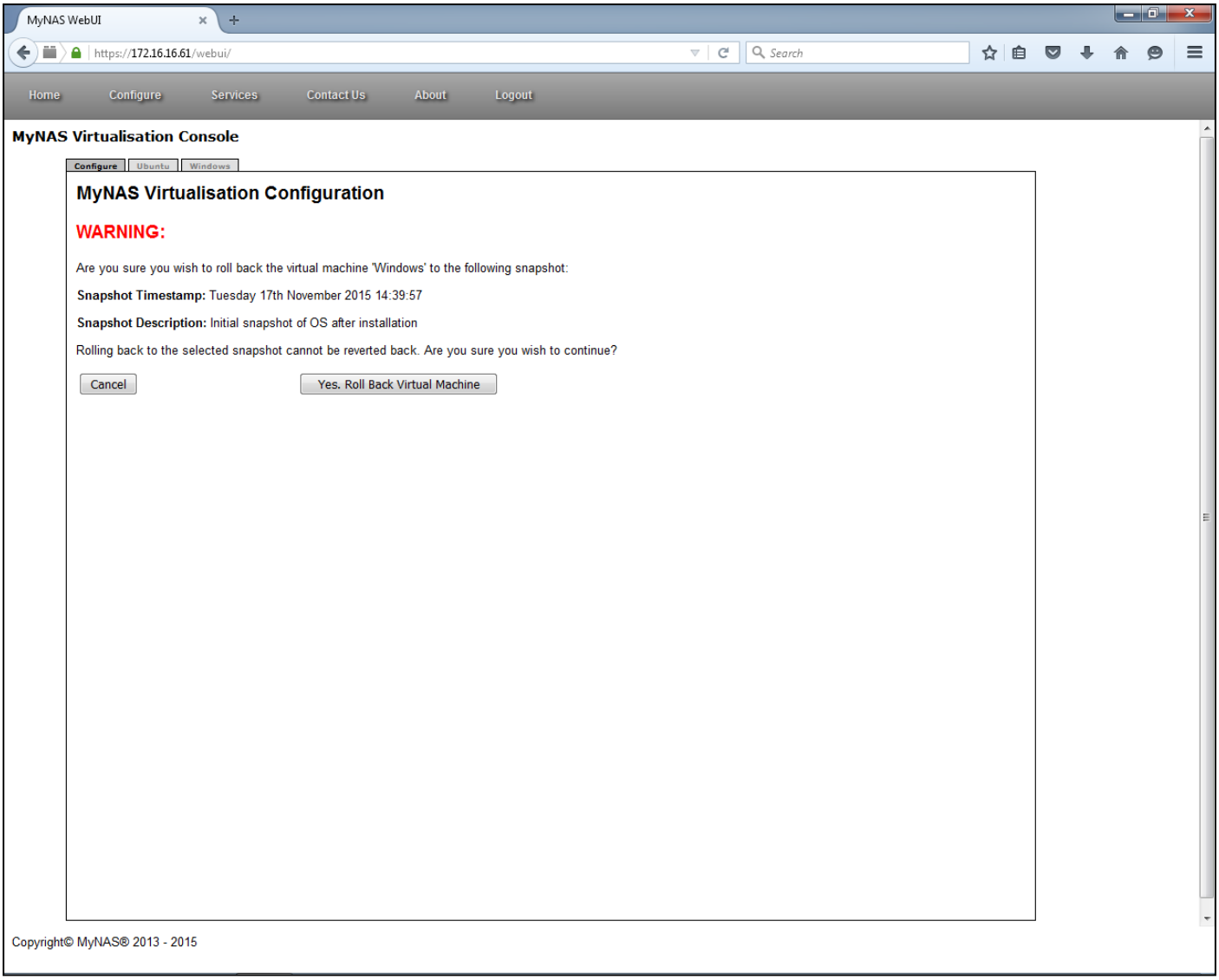


Select the appropriate snapshot to roll back to.

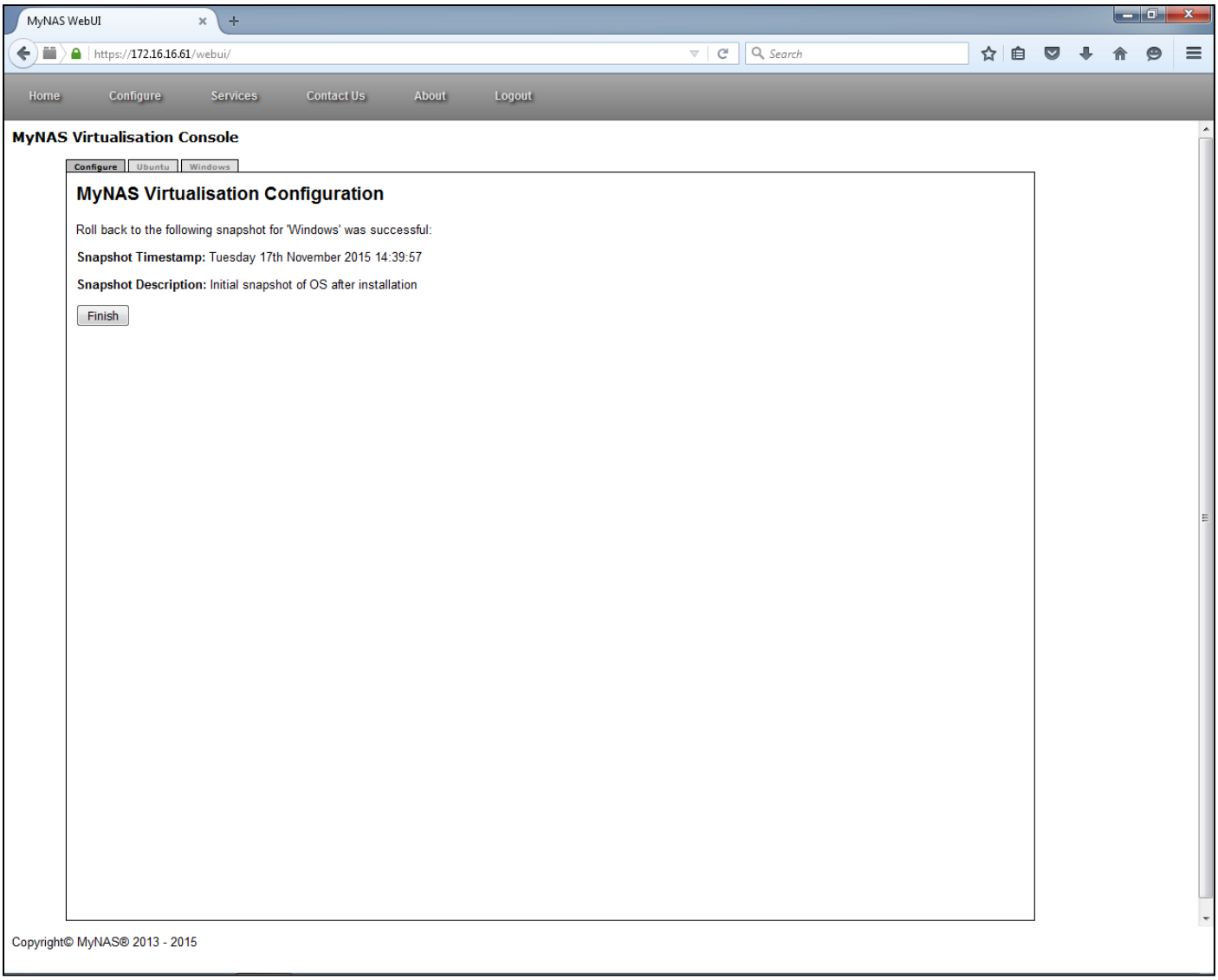
Using the MyNAS CLI, we can also see that the snapshot available for rollback is only currently using 121MB of changed data.



Click 'Next' in the WebUI to roll back to the selected snapshot.



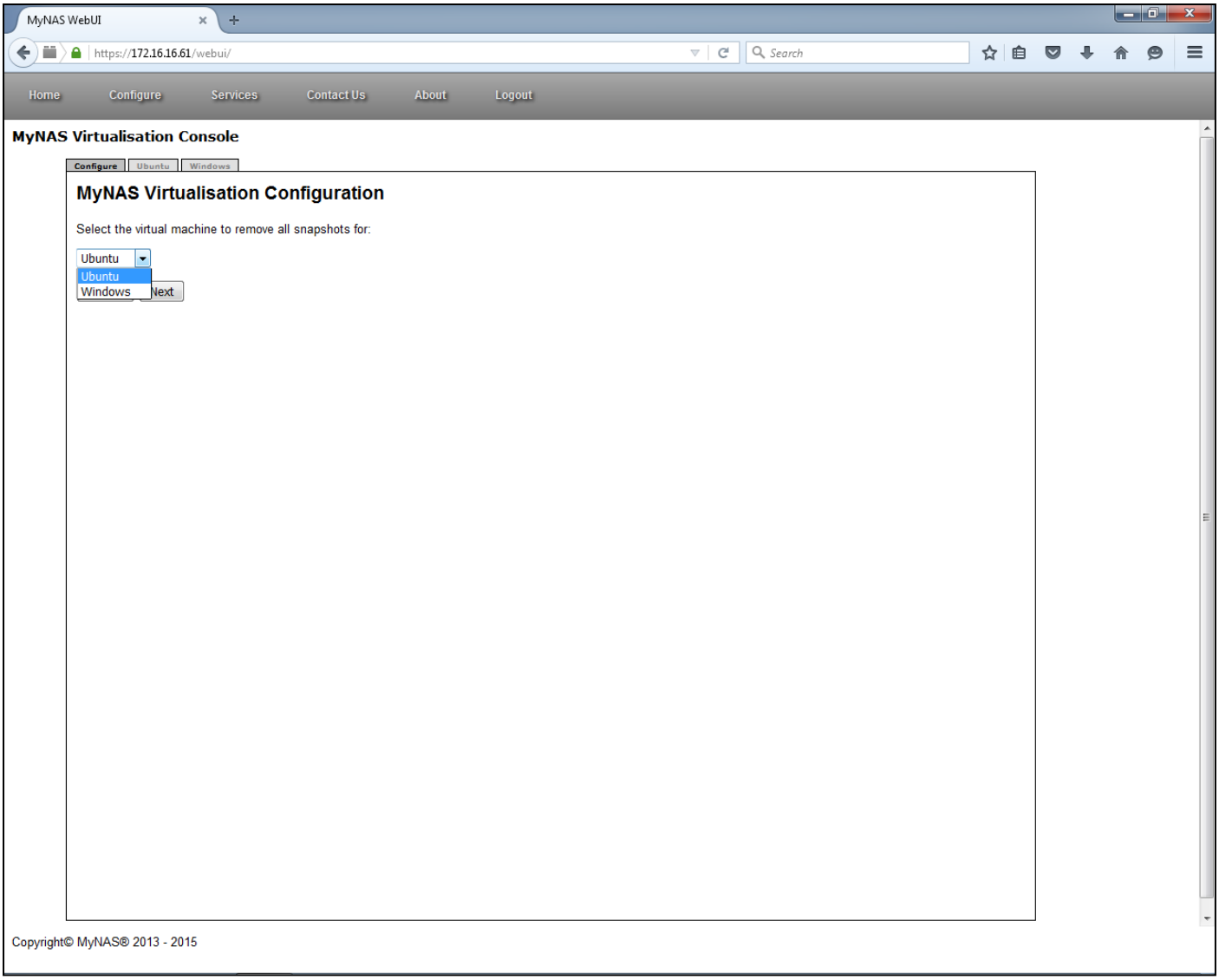
A confirmation to rollback will be presented in-case an incorrect selection was performed. If the selection is OK, click 'Yes. Roll Back Virtual Machine'



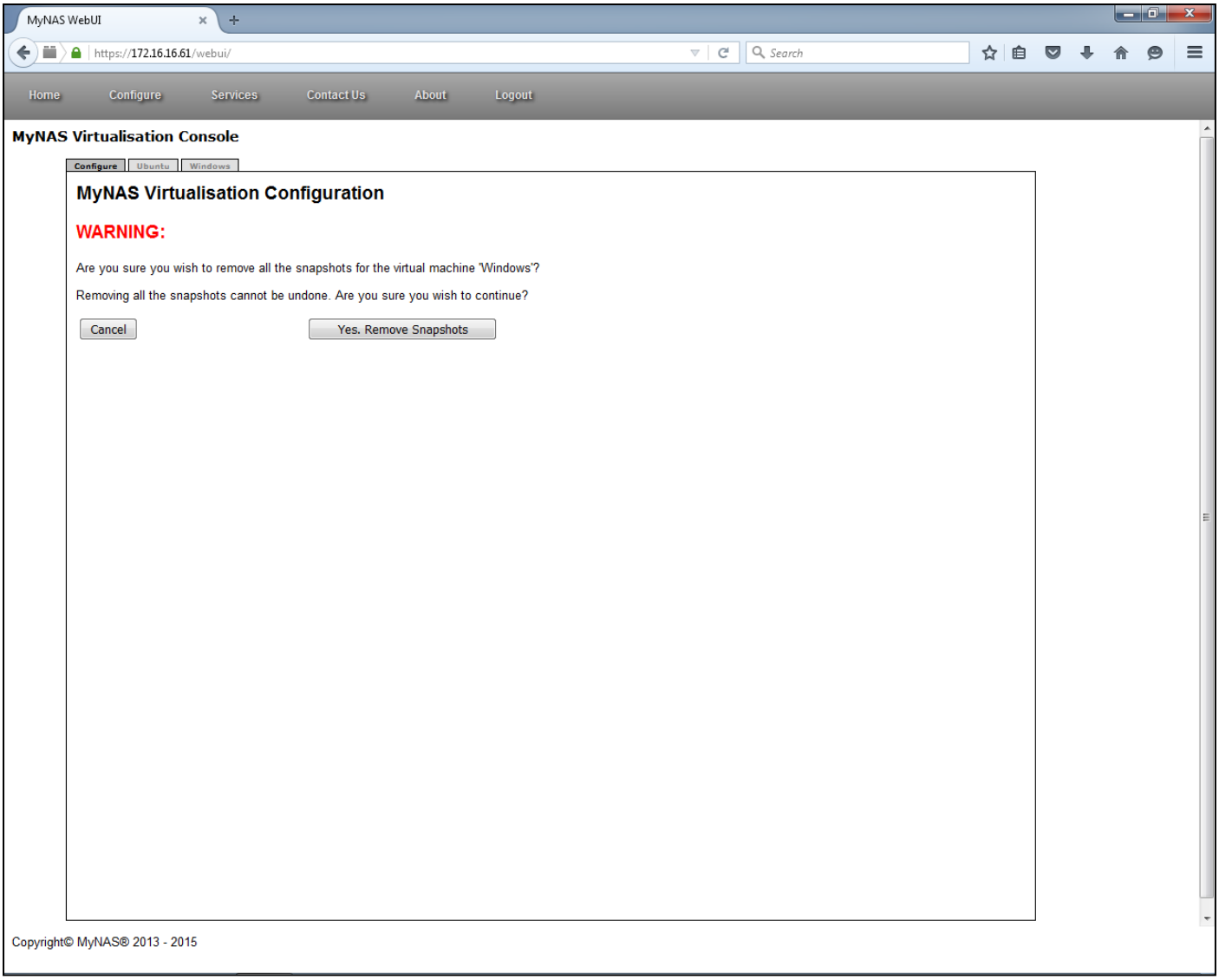
The selected virtual machine will be rolled back to the selected snapshot. Click finish to complete the process.

Remove all snapshots

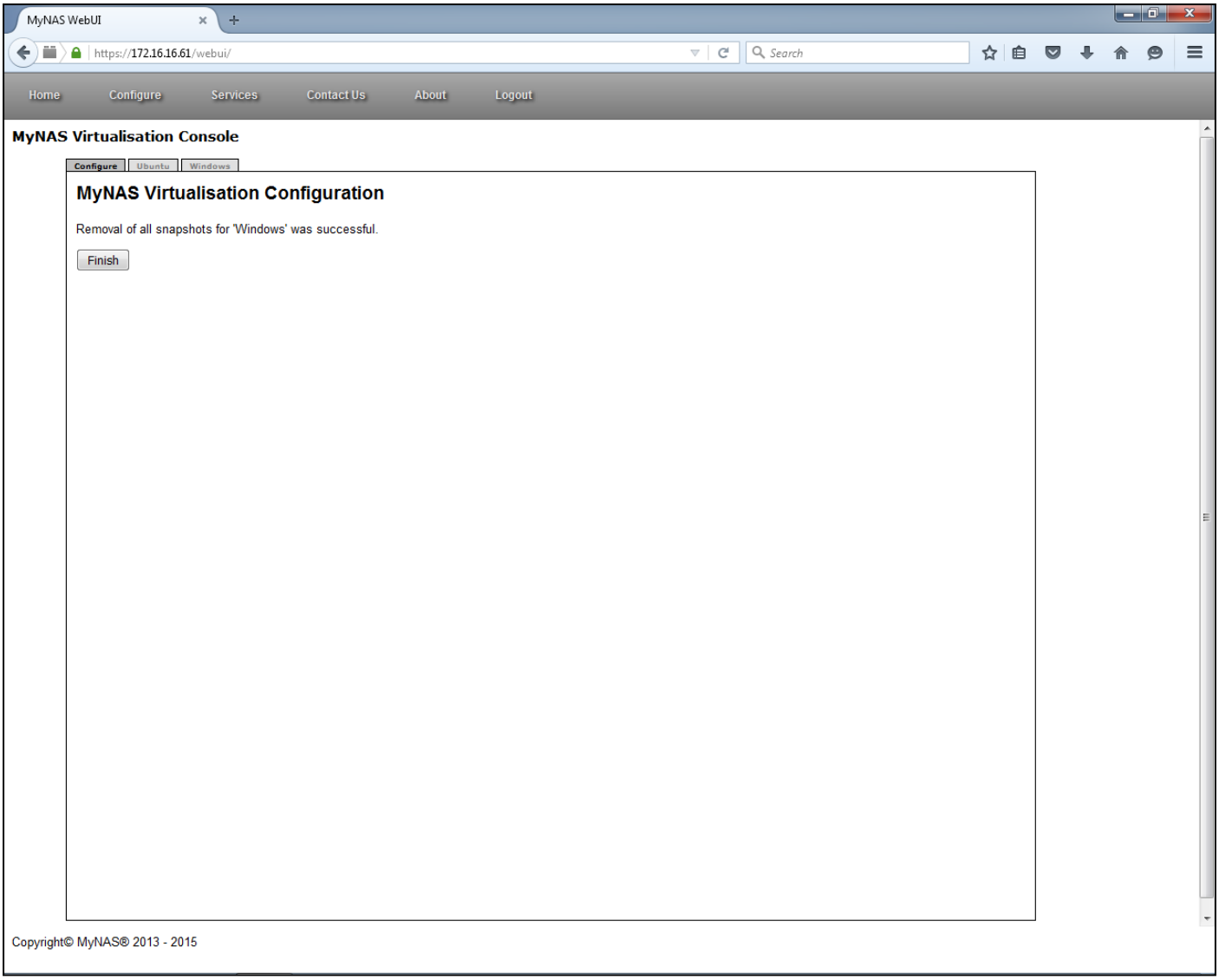
If a particular virtual machine has many unwanted snapshots, or you want to remove all snapshots for a particular machine, use this function to remove them.



Select the virtual machine for snapshot removal, click 'Next'



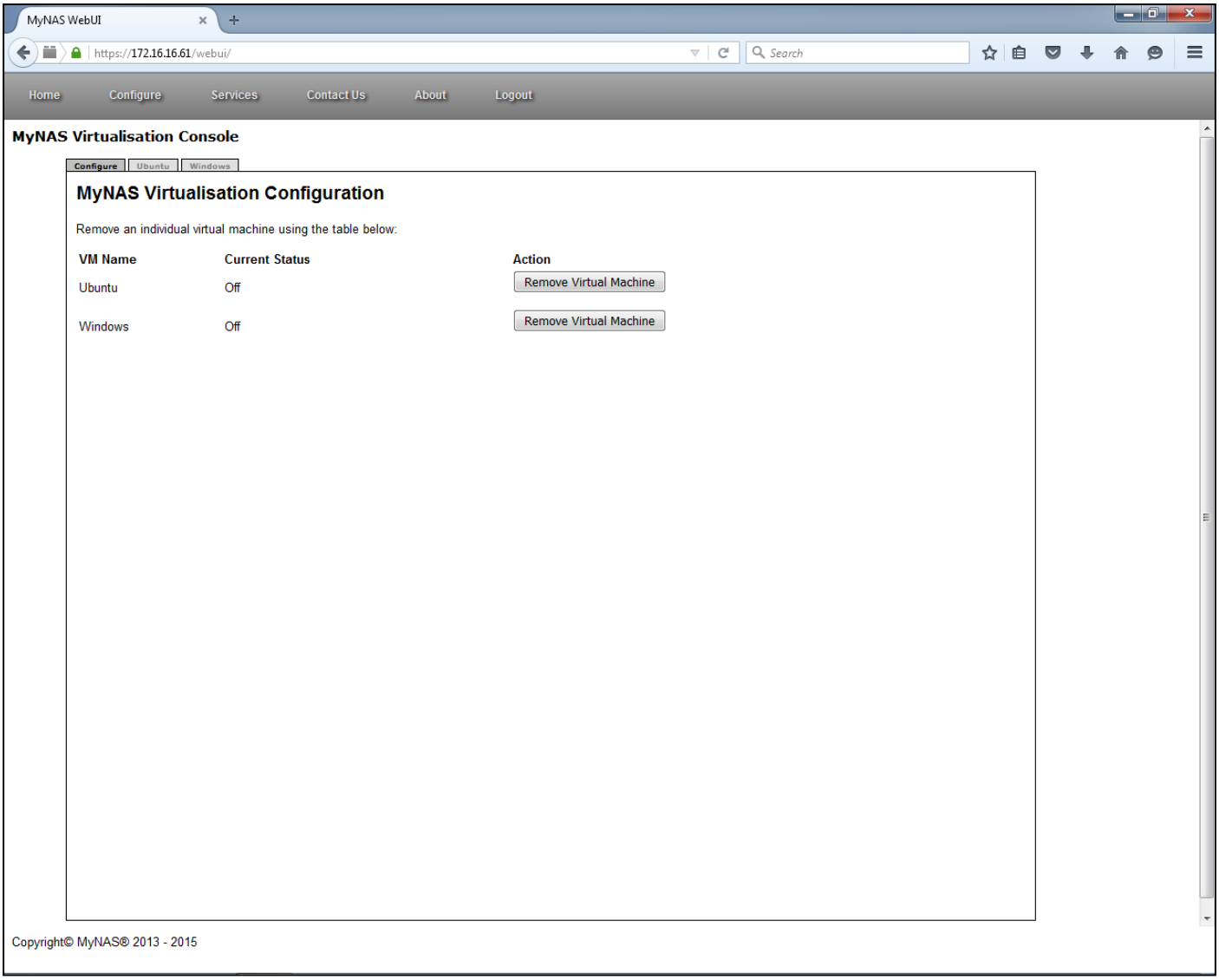
If all is confirmed, click 'Yes. Remove Snapshots'



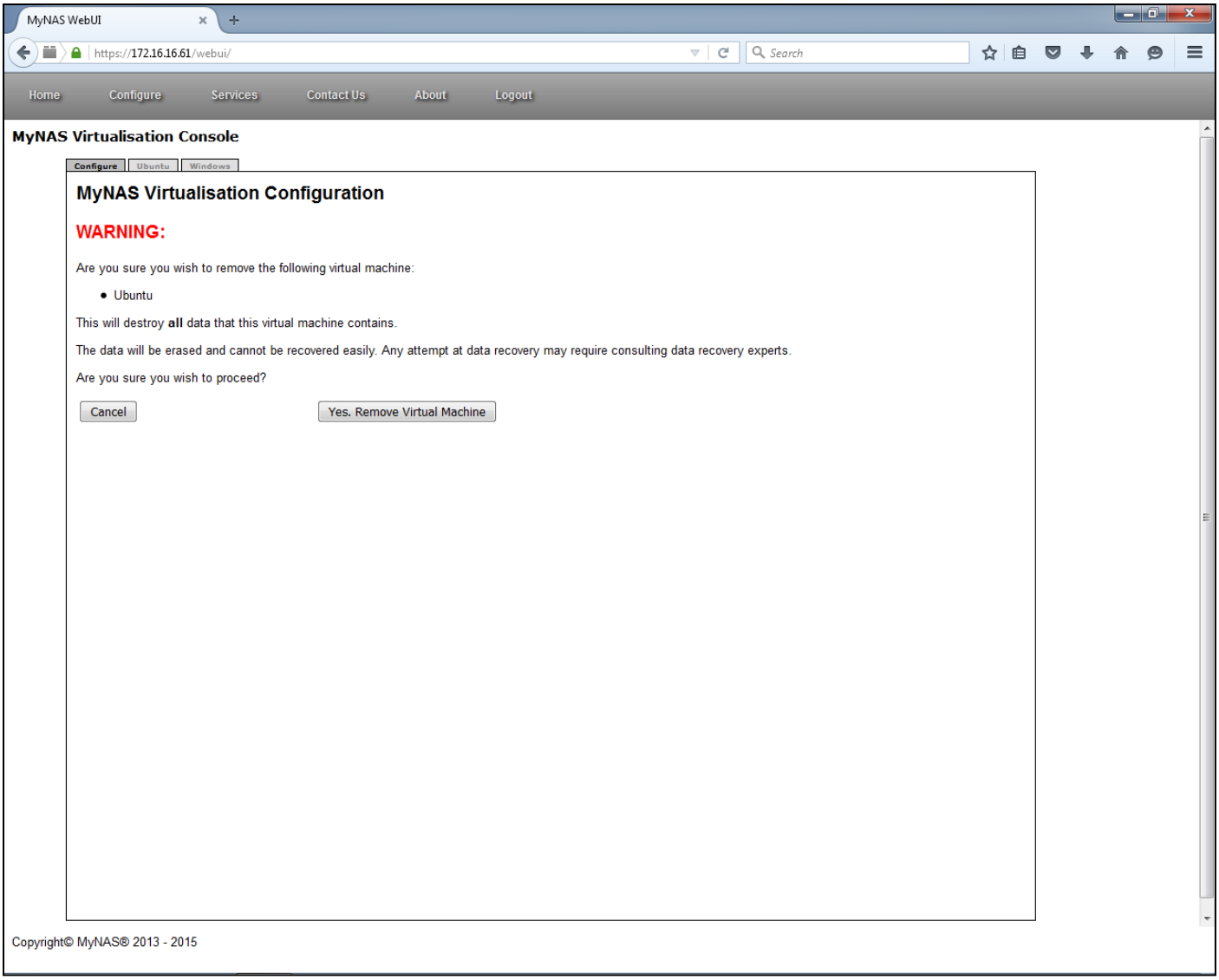
Click 'Finish' to complete the process.

Delete a Virtual Machine

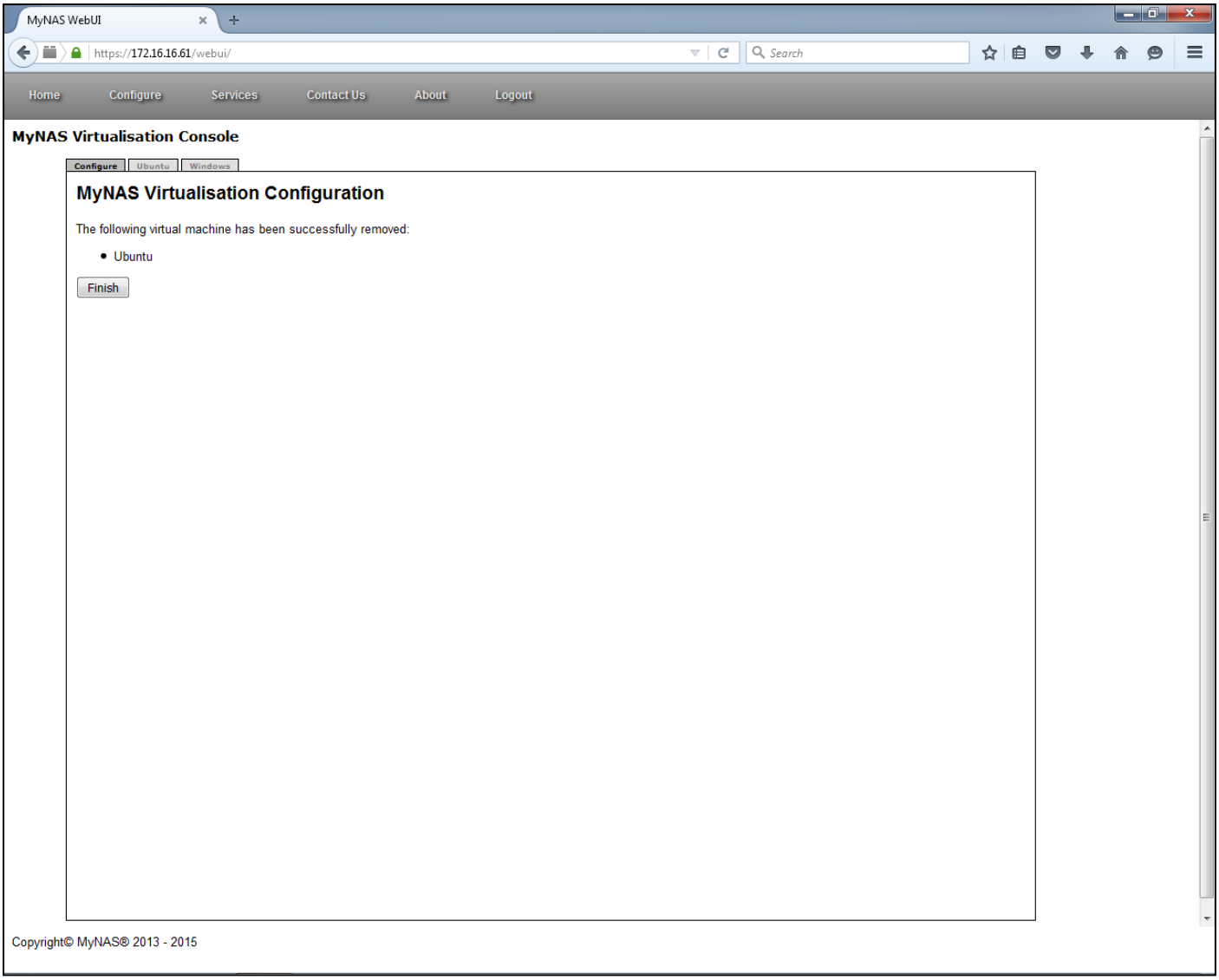
Deleting a virtual machine removes it from your system and is a destructive process. To remove a virtual machine, click the 'Delete Virtual Machine' button.



Select the virtual machine to remove by clicking on the appropriate 'Remove Virtual Machine' button.



Confirm that this is the virtual machine to remove. If it is, click the 'Yes. Remove Virtual Machine' button.

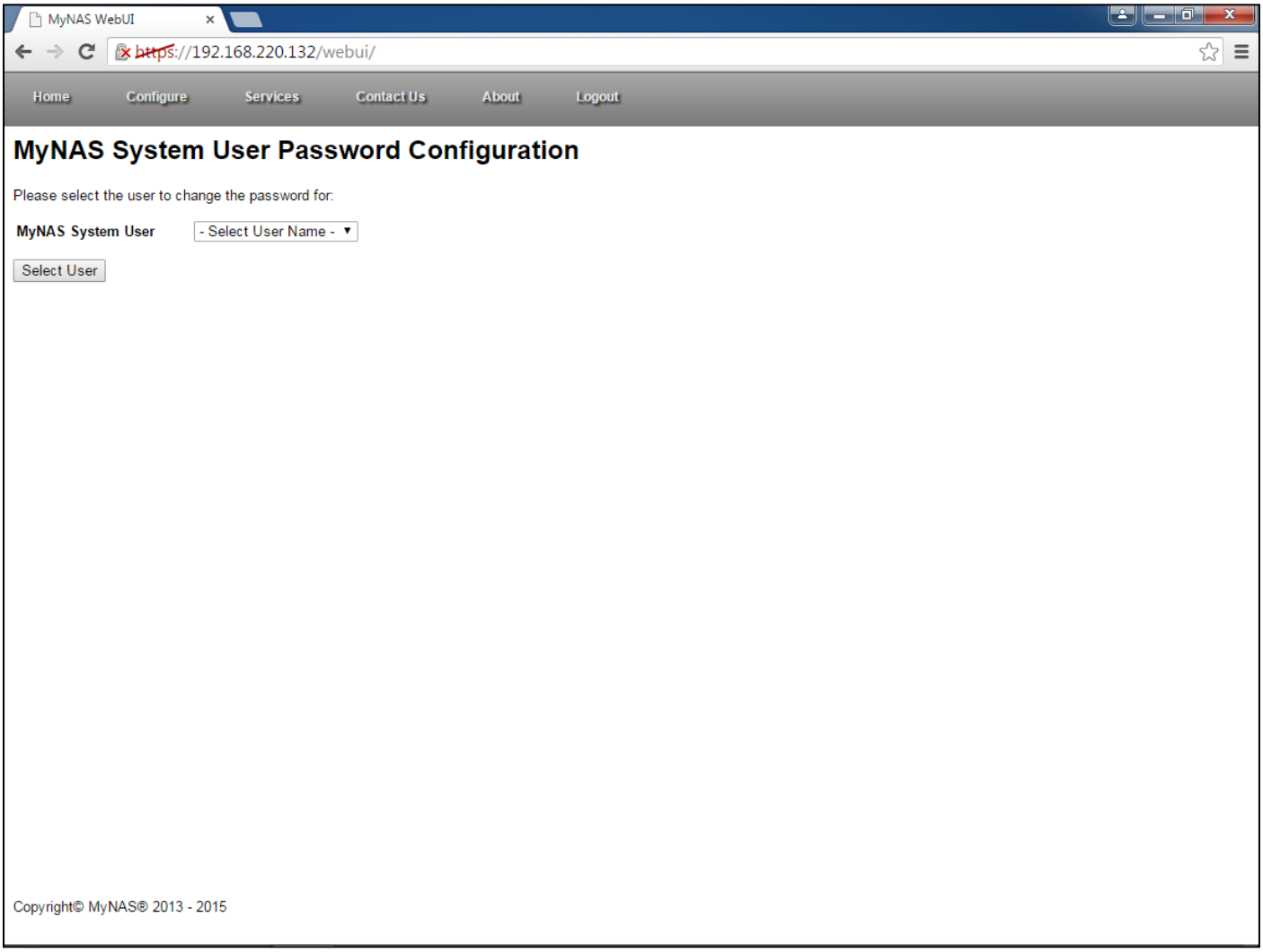


MyNAS will now process the request to remove the virtual machine. Click 'Finish' to complete the process.

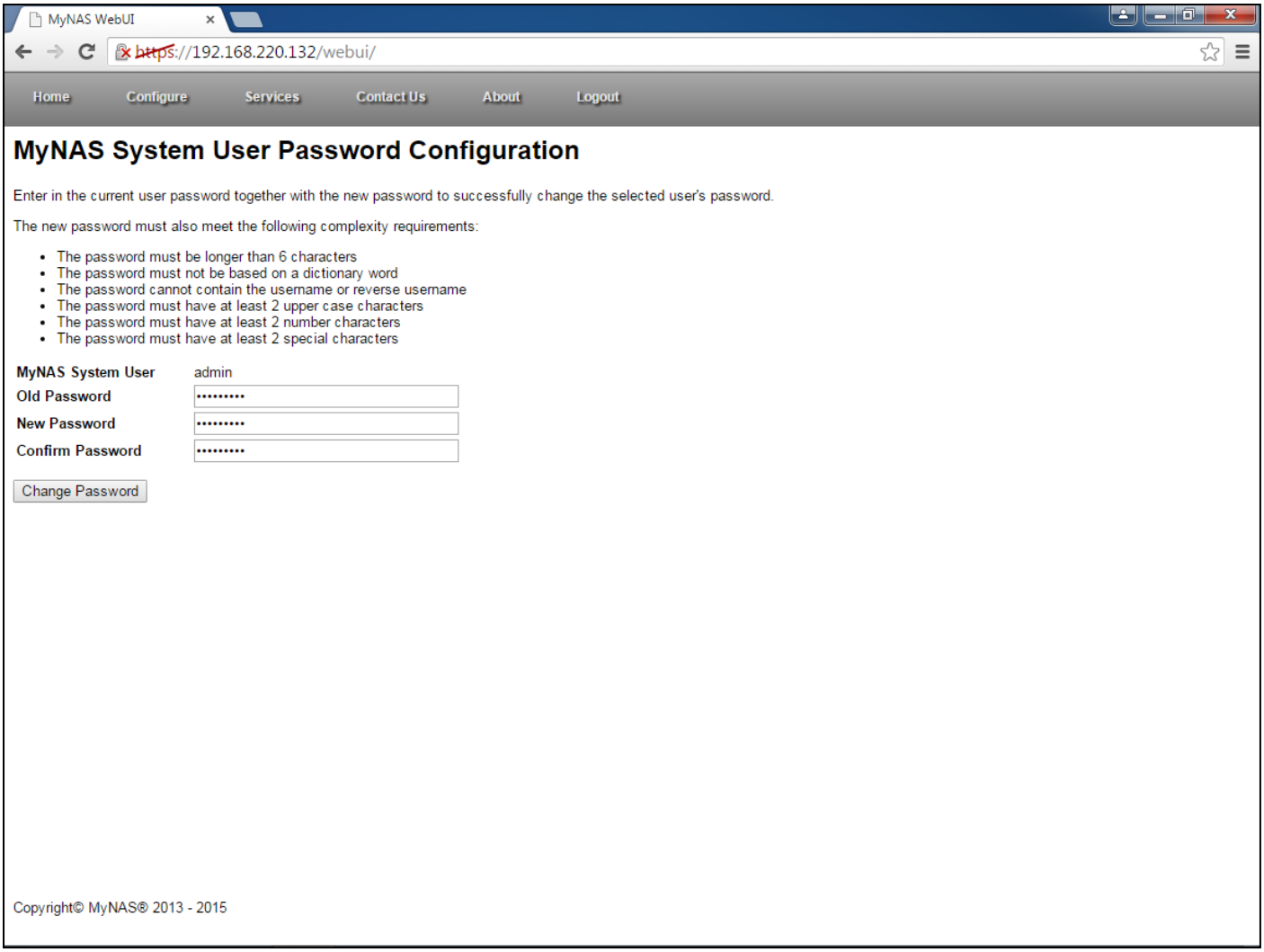
Configure System User Passwords

To change the default passwords for the 3 MyNAS Storage Appliance built-in users, follow the directions below.

From the MyNAS WebUI, login as the 'enable' user. From the 'Configure' menu, select 'Configure System User Passwords', and the following will be displayed:



From the drop down menu, select the user which you would like to change the password for. Once the user is selected, click the 'Select User' button.

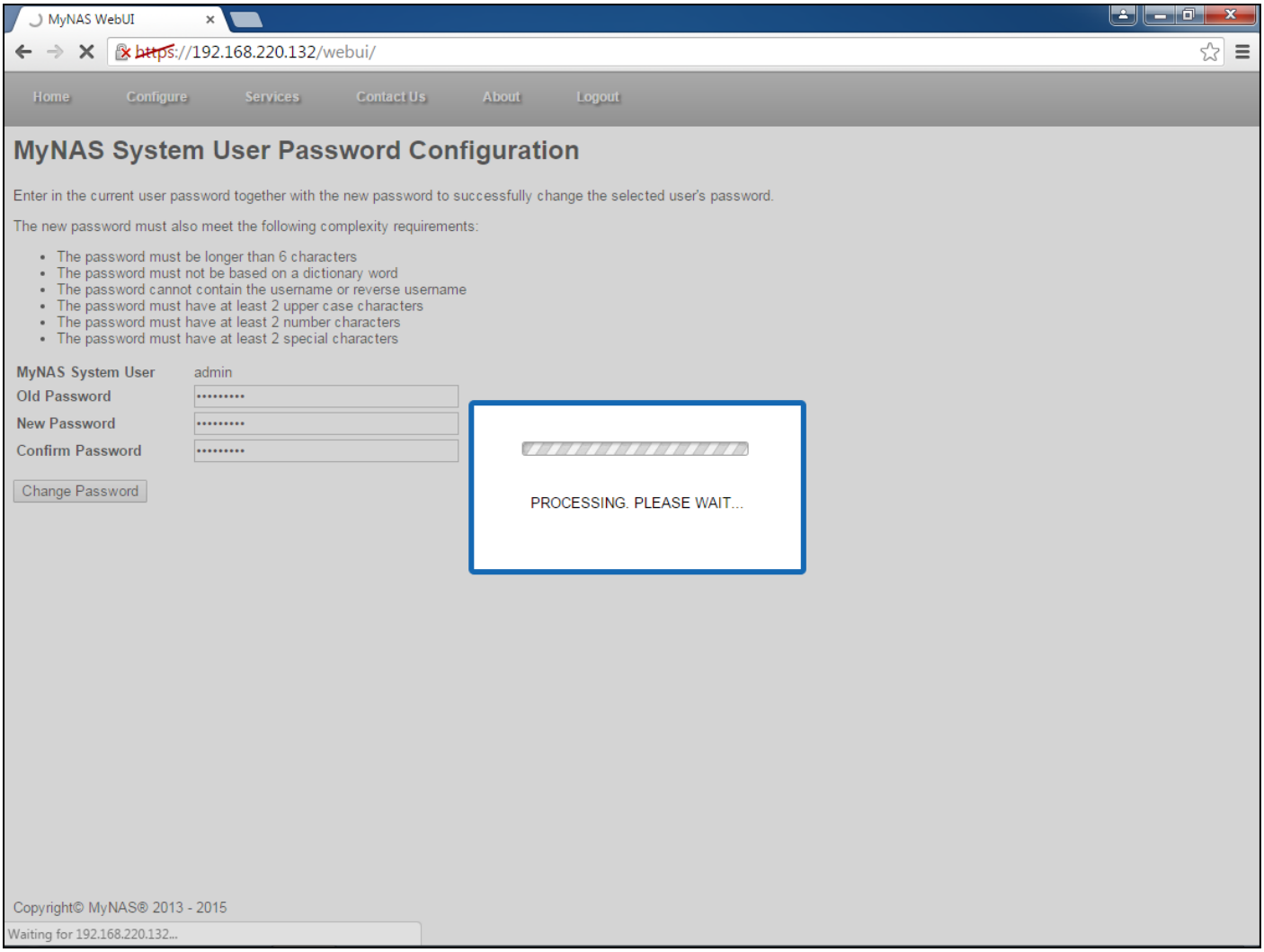


Type in the existing user password, along with the new password and confirmation.

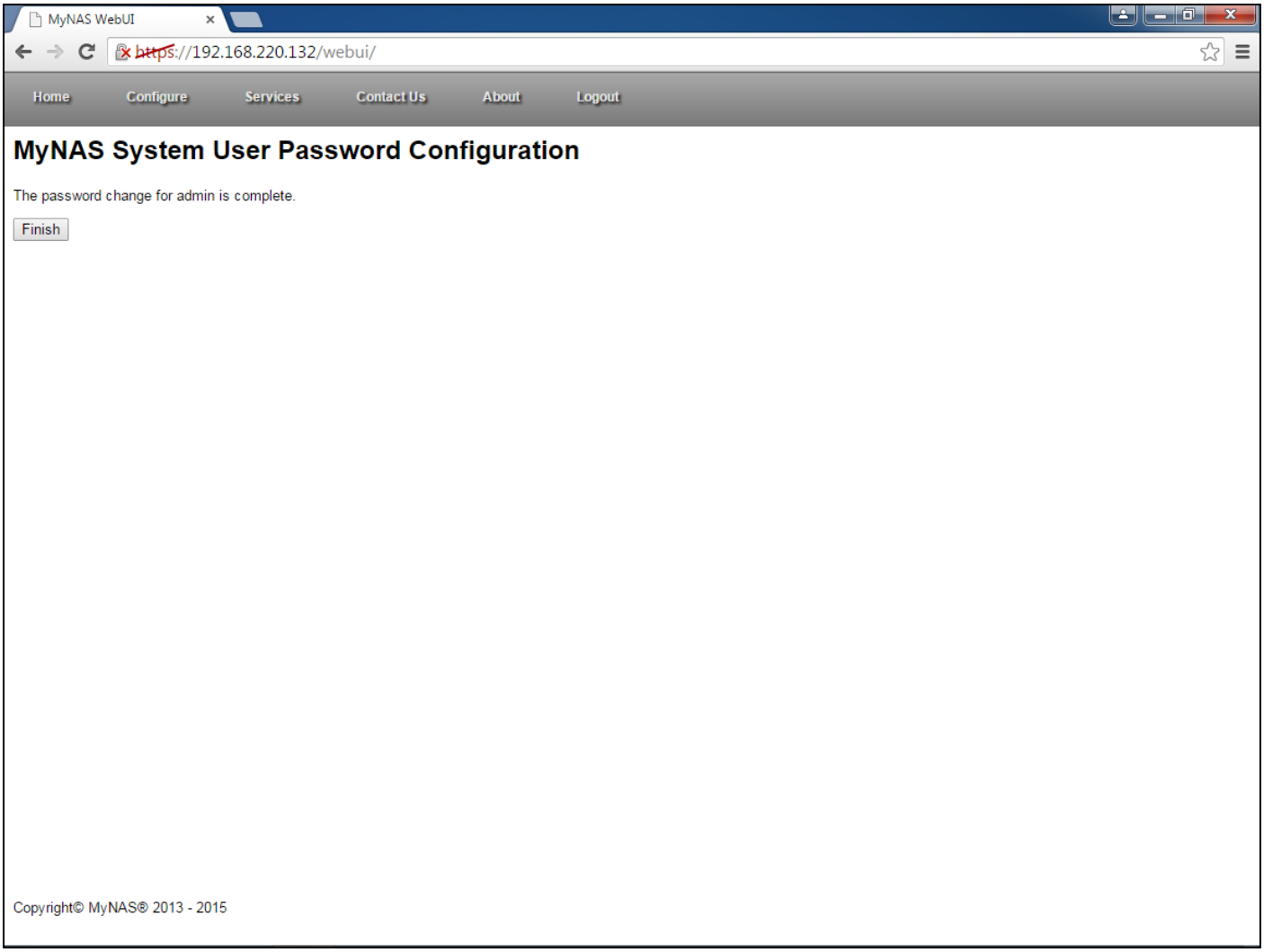
Note: The password must conform to the following password complexity requirements:

- The password must be longer than 6 characters
- The password must not be based on a dictionary word
- The password cannot contain the username or reverse username
- The password must have at least 2 upper case characters
- The password must have at least 2 number characters
- The password must have at least 2 special characters

Once the passwords have been entered, click the 'Change Password' button. MyNAS will now process the request



Once complete, MyNAS will display the following:



Click Finish to complete the process.

Note: If changing the 'enable' user password, you will be automatically logged out, requiring to log back in with the new password.

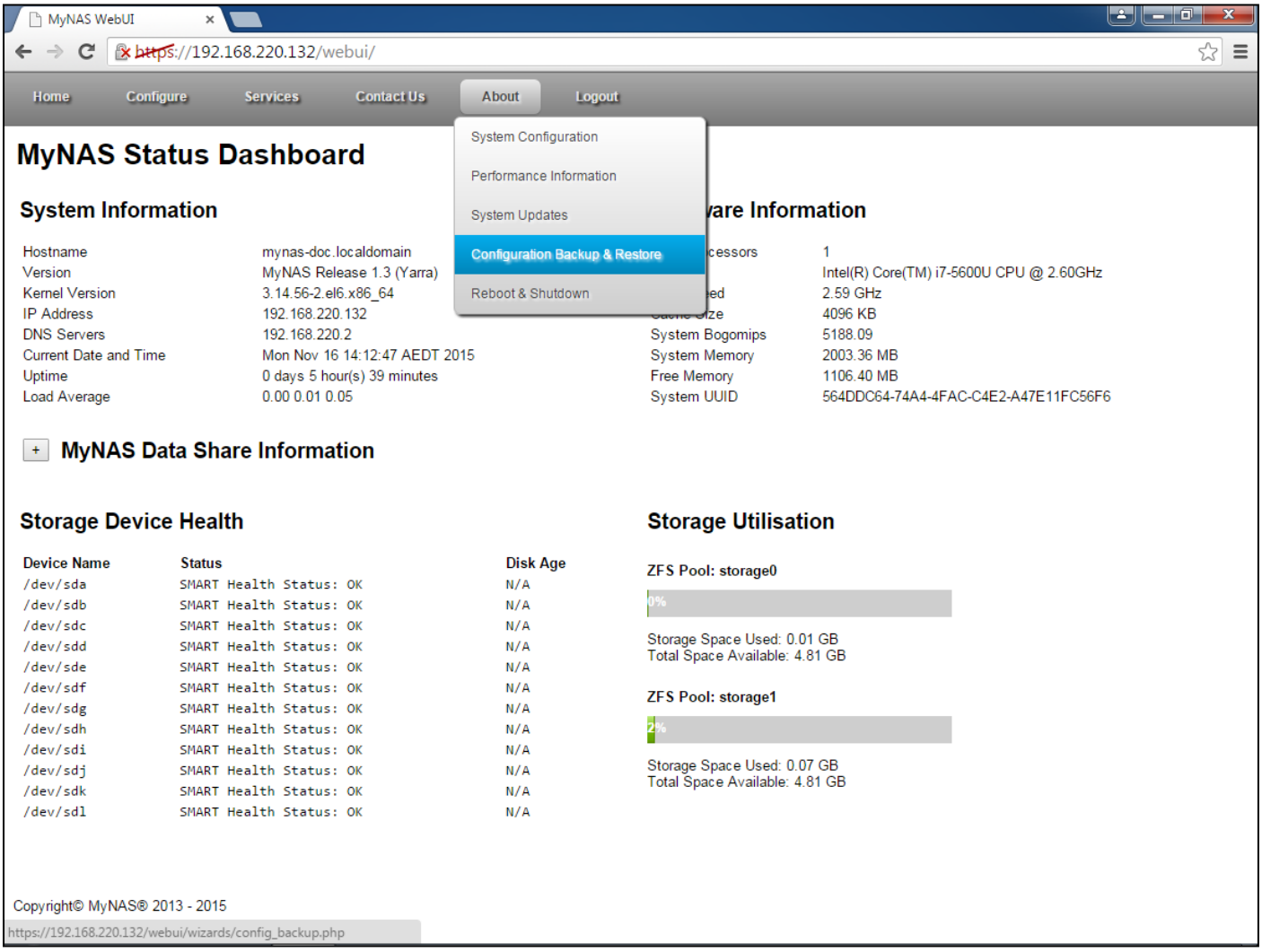
Backup and Restore your MyNAS Configuration

MyNAS provides the capability to backup and restore your configuration. This is useful in the following circumstances:

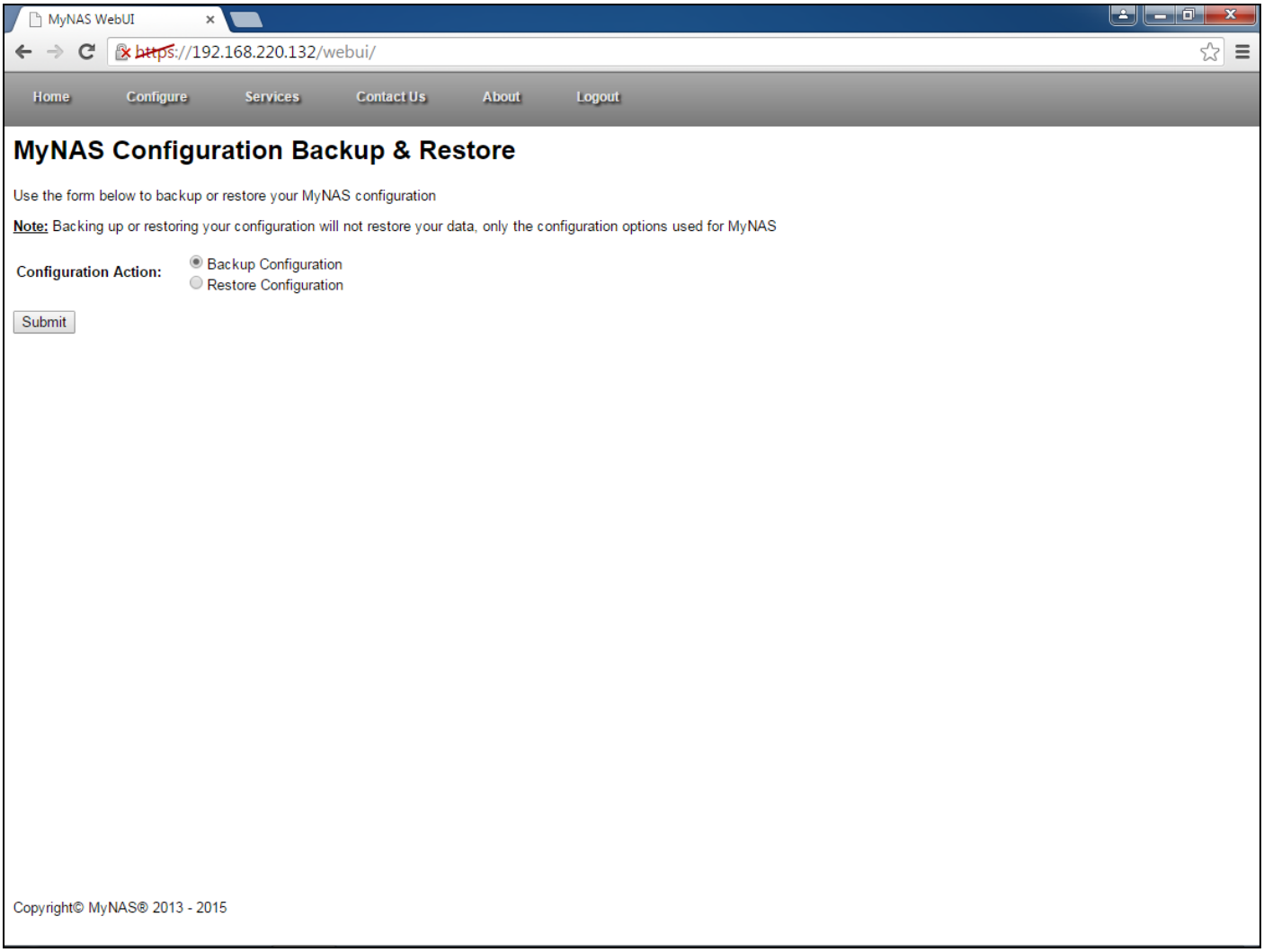
- Moving your data drives to a new system
- Re-install of MyNAS

Backup your existing configuration

To backup your existing configuration, click on the About menu and select the 'Configuration Backup & Restore' option:

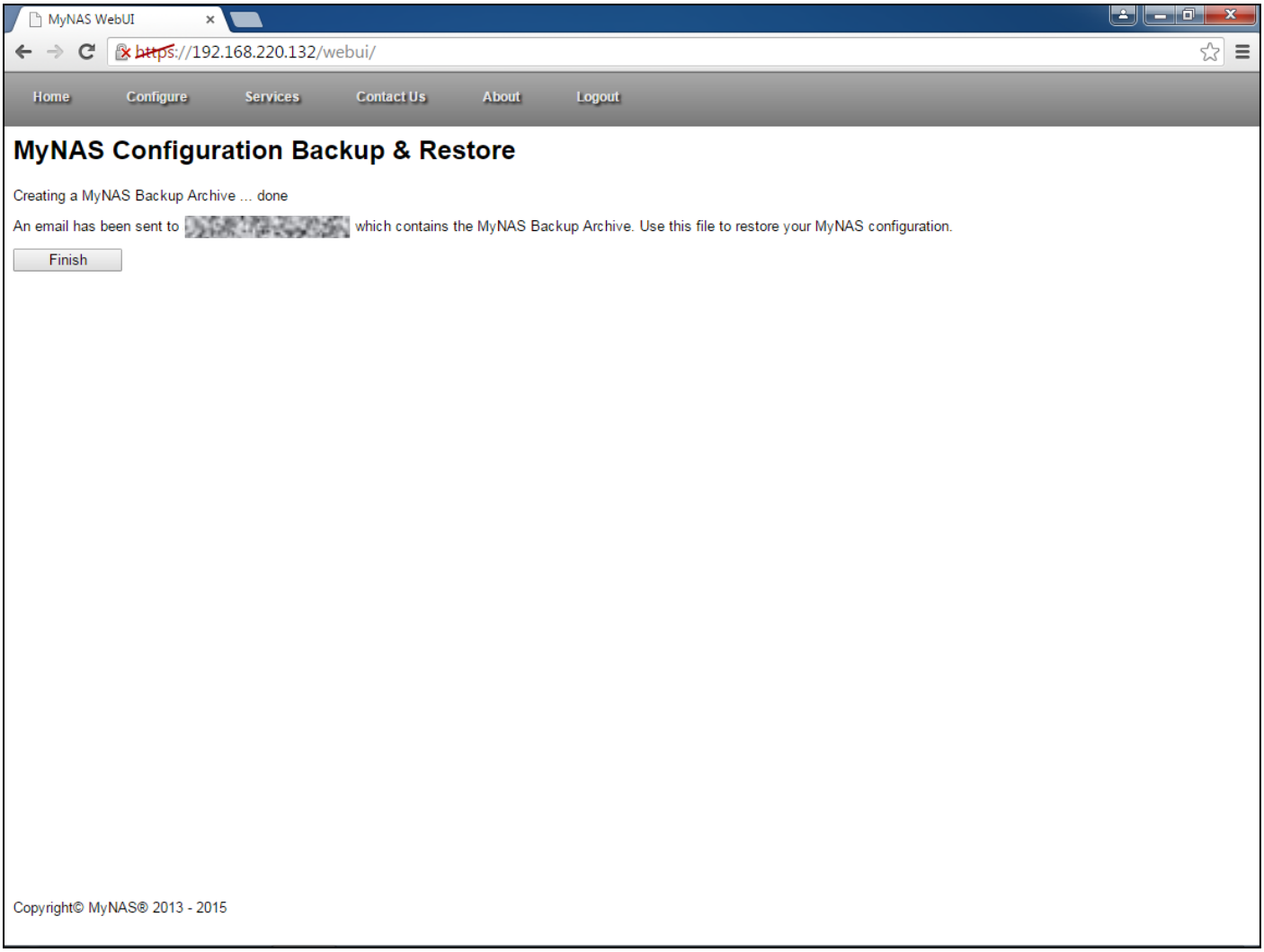


Once selected, the following will be displayed:

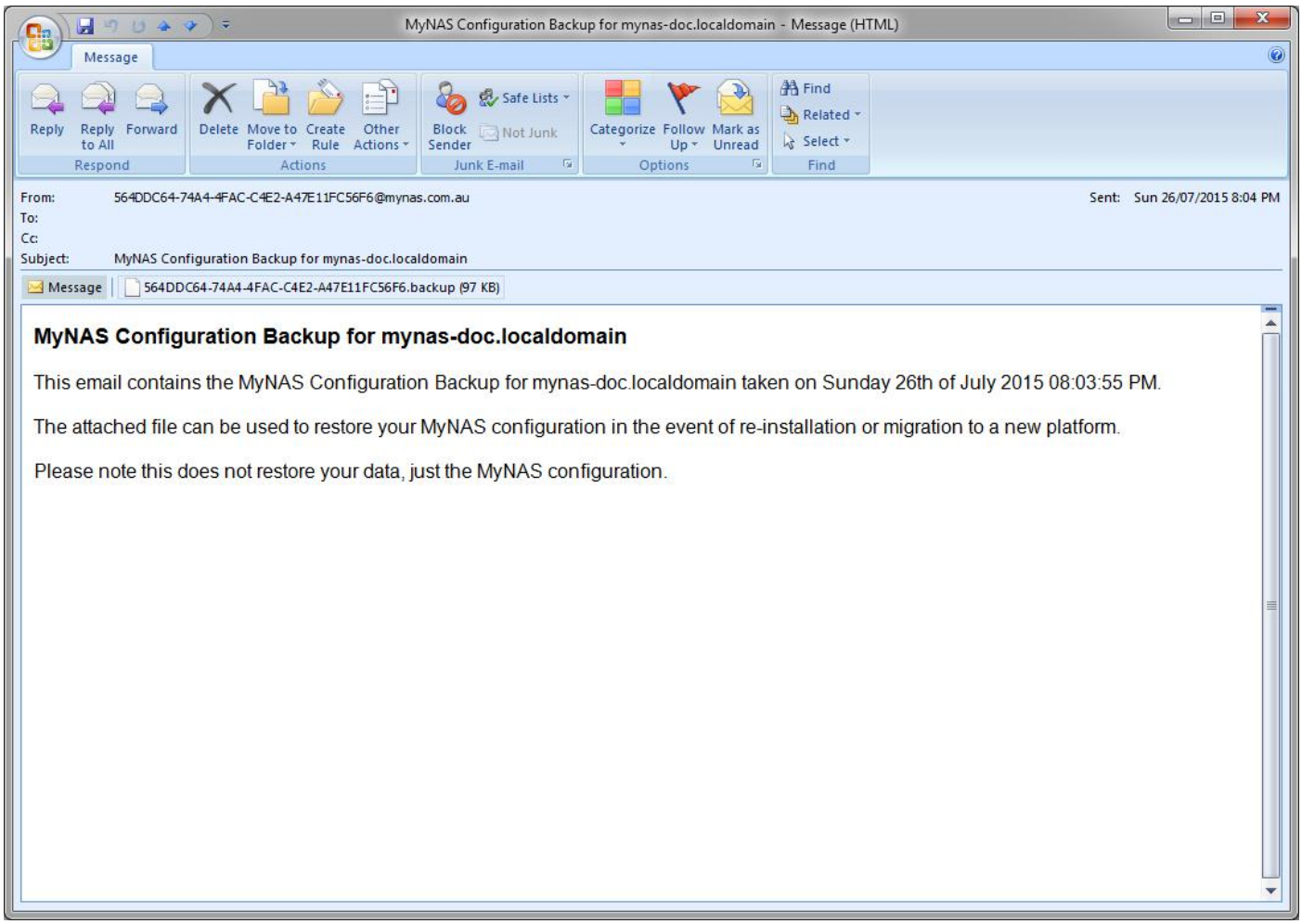


The default option is to backup your configuration. Click 'Submit' to complete the action.

MyNAS will now perform the backup operation:



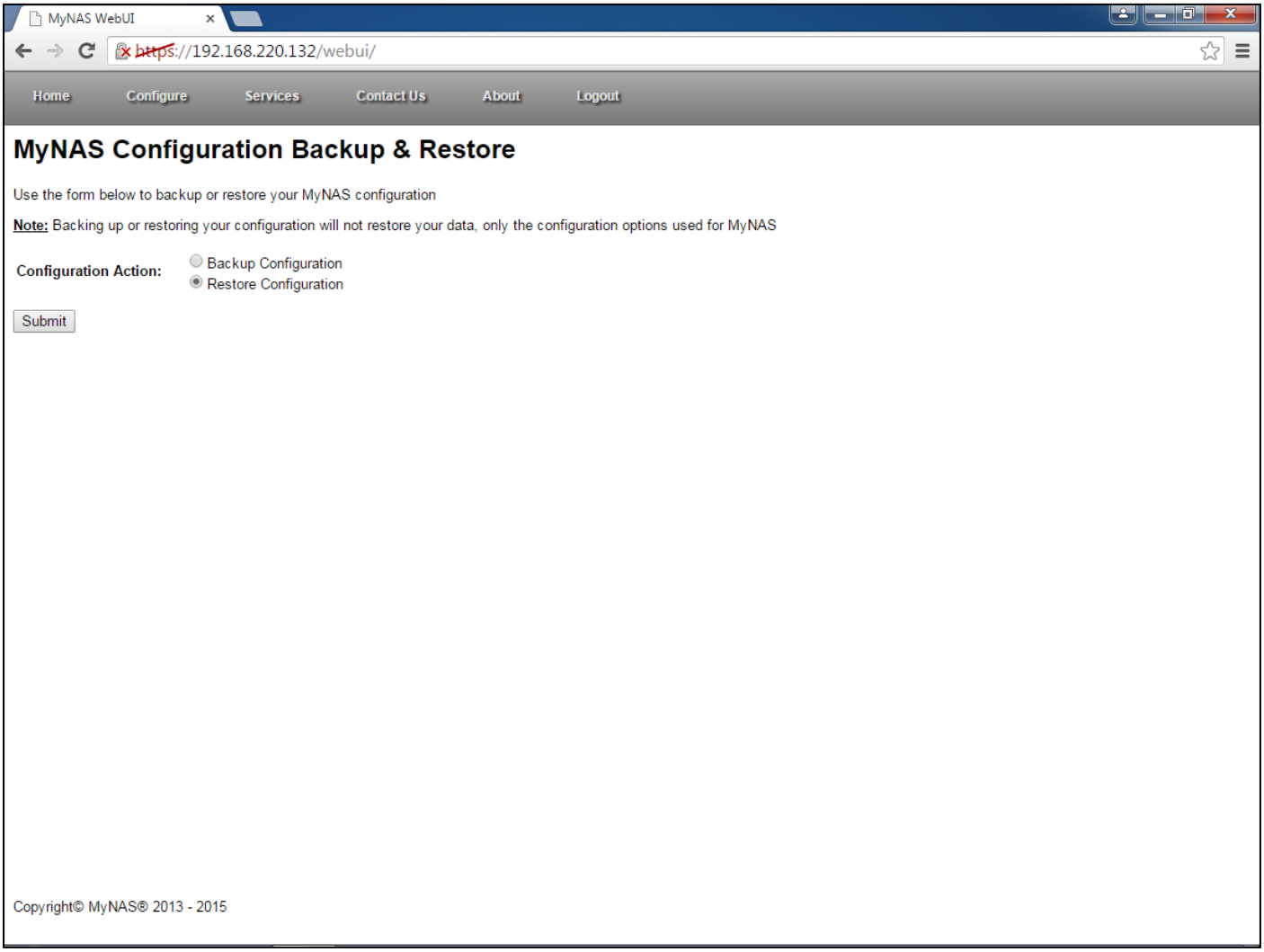
The contents of the email is as follows:



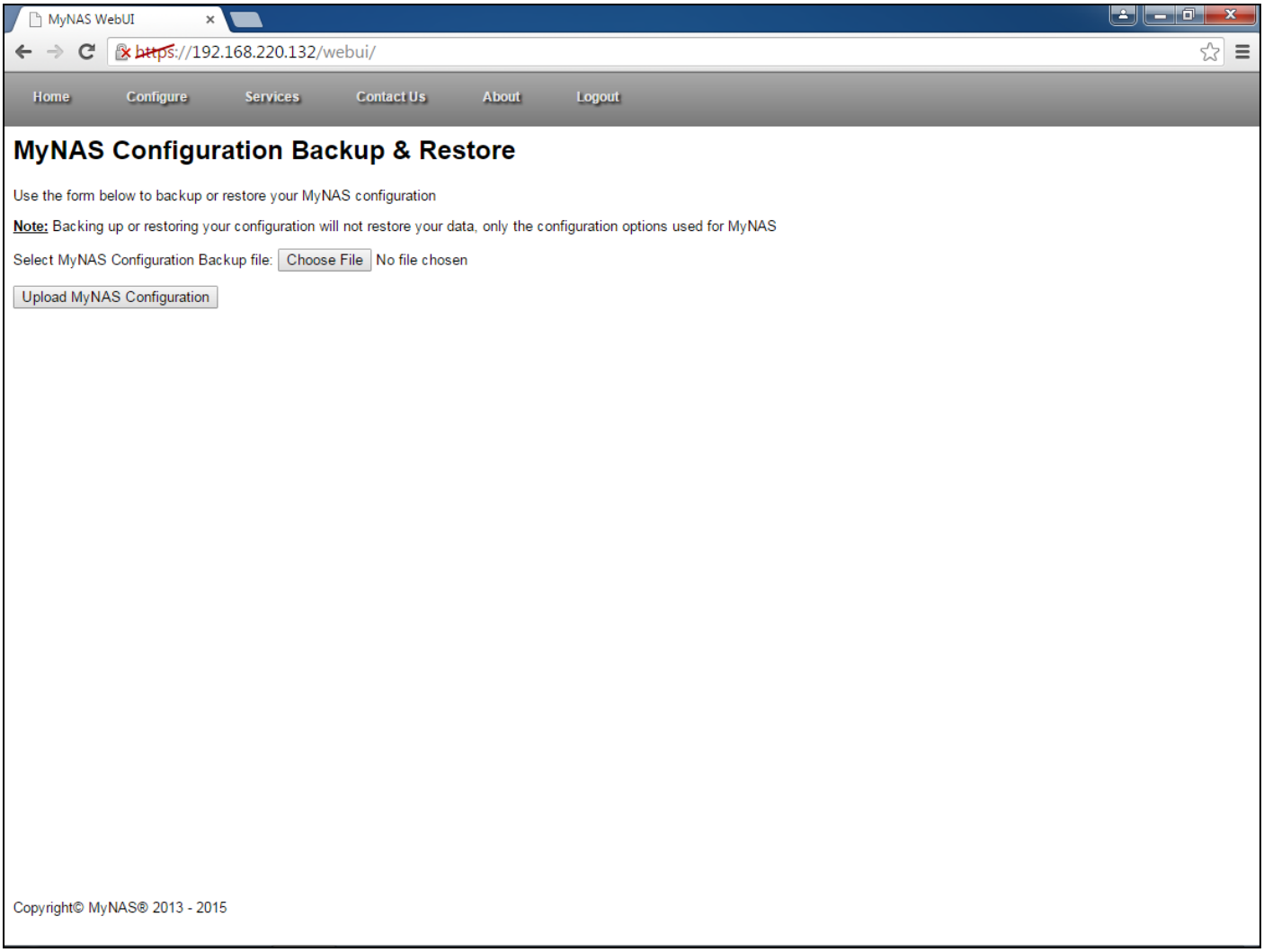
The attached .backup file contains all the required information to restore your MyNAS configuration.

Restoring your MyNAS configuration

To backup your existing configuration, click on the About menu and select the 'Configuration Backup & Restore' option, and click the radio button to restore your configuration:

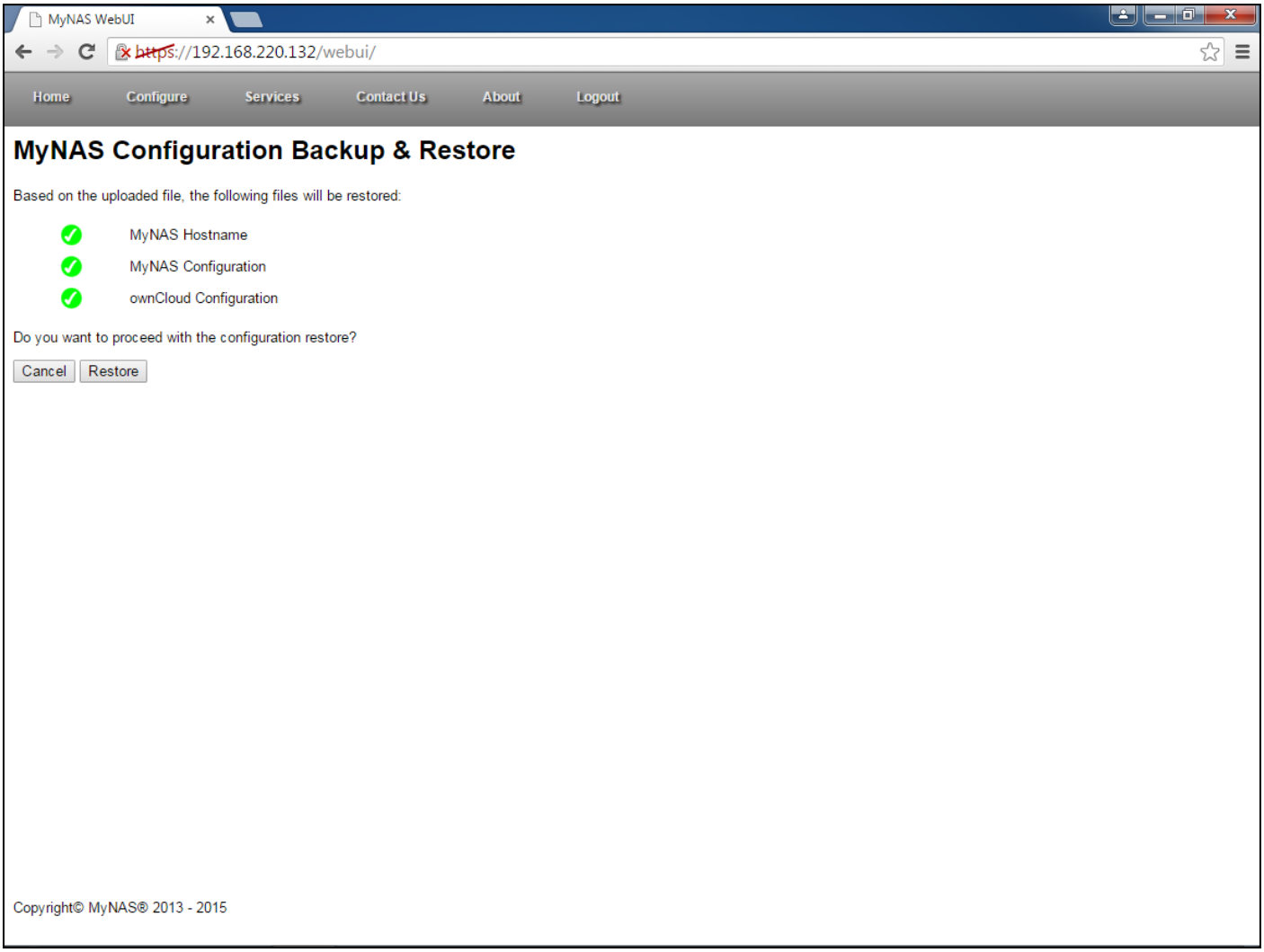


Click 'Submit' with the Restore Configuration option selected



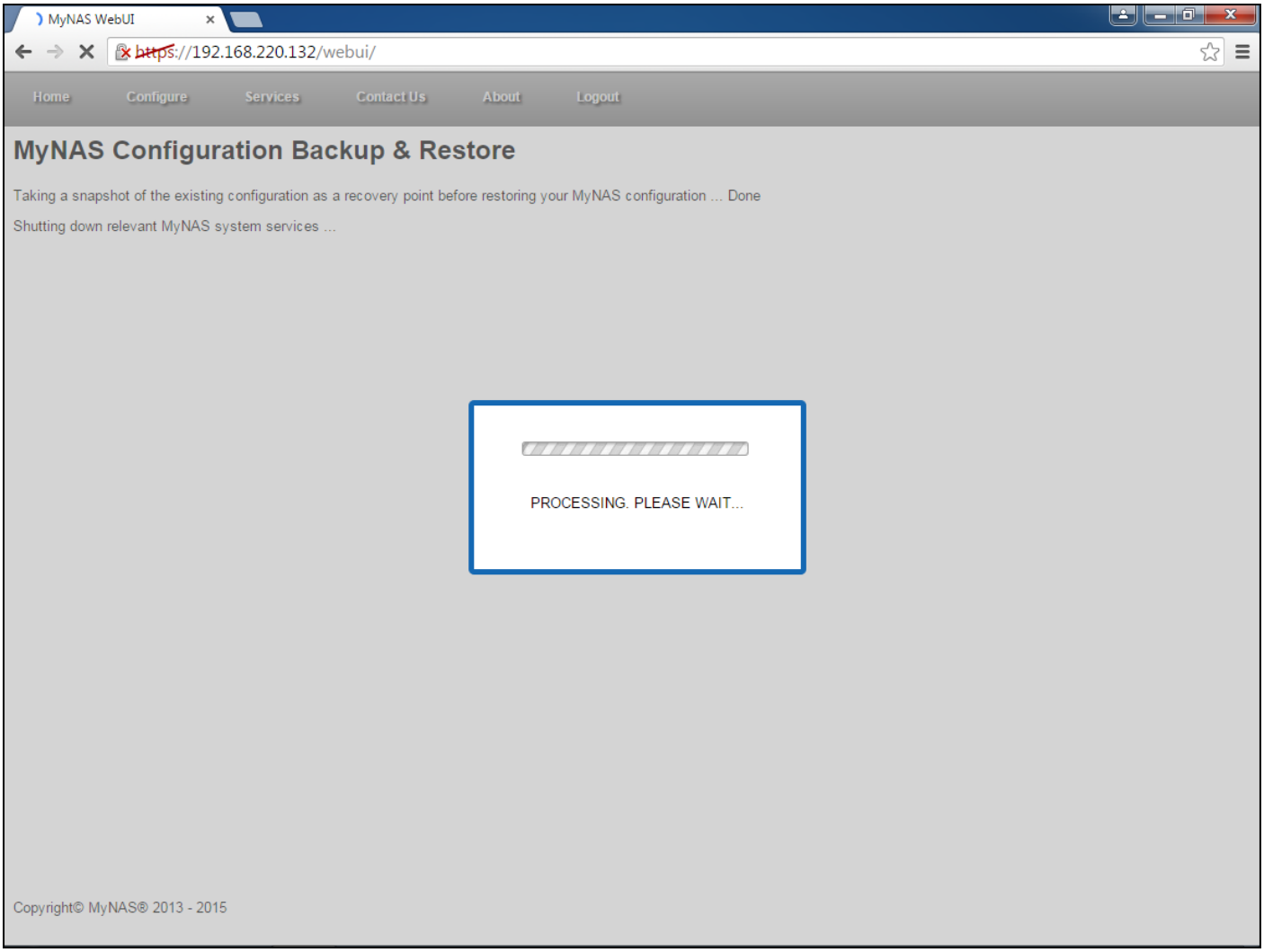
Click the 'Choose File' button, and select the applicable MyNAS Backup file to restore the configuration with. Once the right file is selected, click the 'Upload MyNAS Configuration button.

MyNAS will now test the integrity of the file you have selected. If the integrity of the file is OK, it will be processed to advise what will be restored as part of this file:

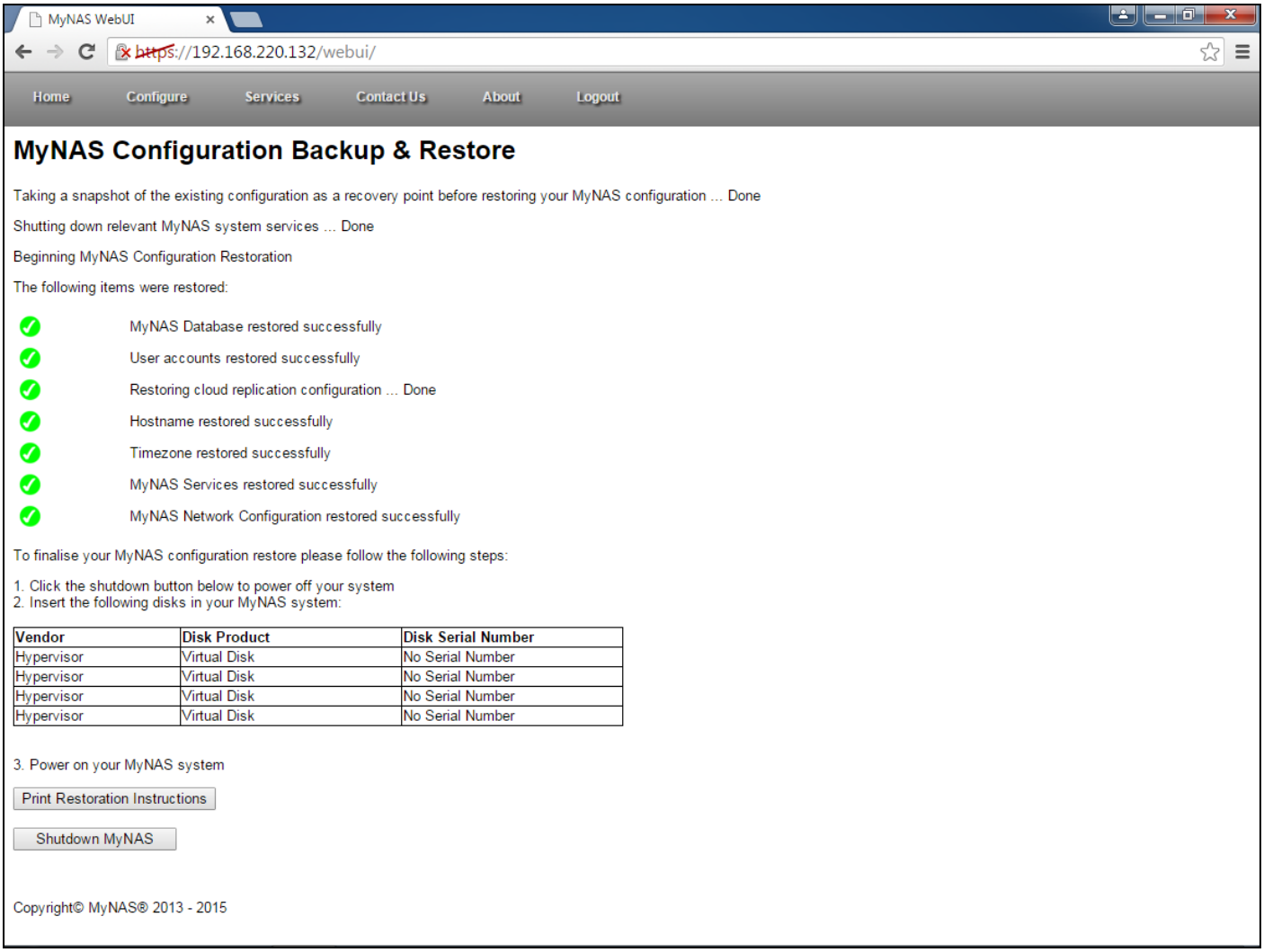


If you are happy to proceed with the restore, click the 'Restore' button.

MyNAS will now shutdown various services to begin the restoration process:



Once the restoration is complete, the following will be displayed, detailing the final restoration instructions:



Print out the instructions if required, and click the 'Shutdown MyNAS' button.

Whilst your MyNAS Storage Appliance is shutdown, perform the required disk operations before powering on the MyNAS Storage Appliance again.

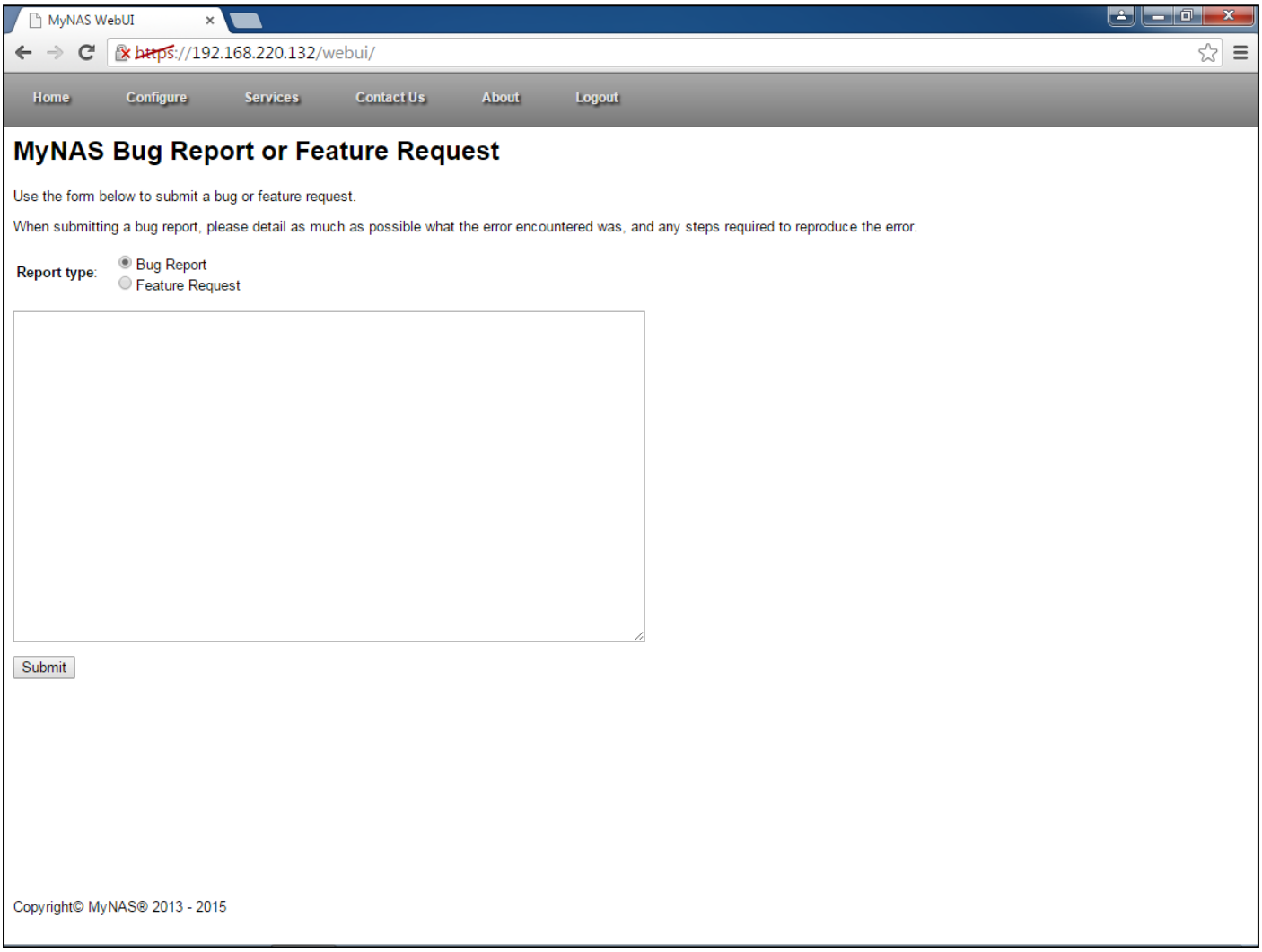
Contact MyNAS Support

There are two ways to obtain support for MyNAS for any issue uncovered or for technical support. These are:

- Use the MyNAS WebUI to submit a support request / log a feature request via email
- Access the MyNAS forums

Submit a support request via email

To submit a support request via email, log in to the MyNAS WebUI, and select the 'Contact Us' menu. From the drop down, select to 'Report a Bug or Feature Request', and the following will be displayed:



Fill in all the appropriate details regarding your situation, problem including any detailed steps on how to reproduce, or if it is feature request, detail your request as much as possible. Once complete, click the Submit button and an email will be generated from your MyNAS installation to MyNAS support.

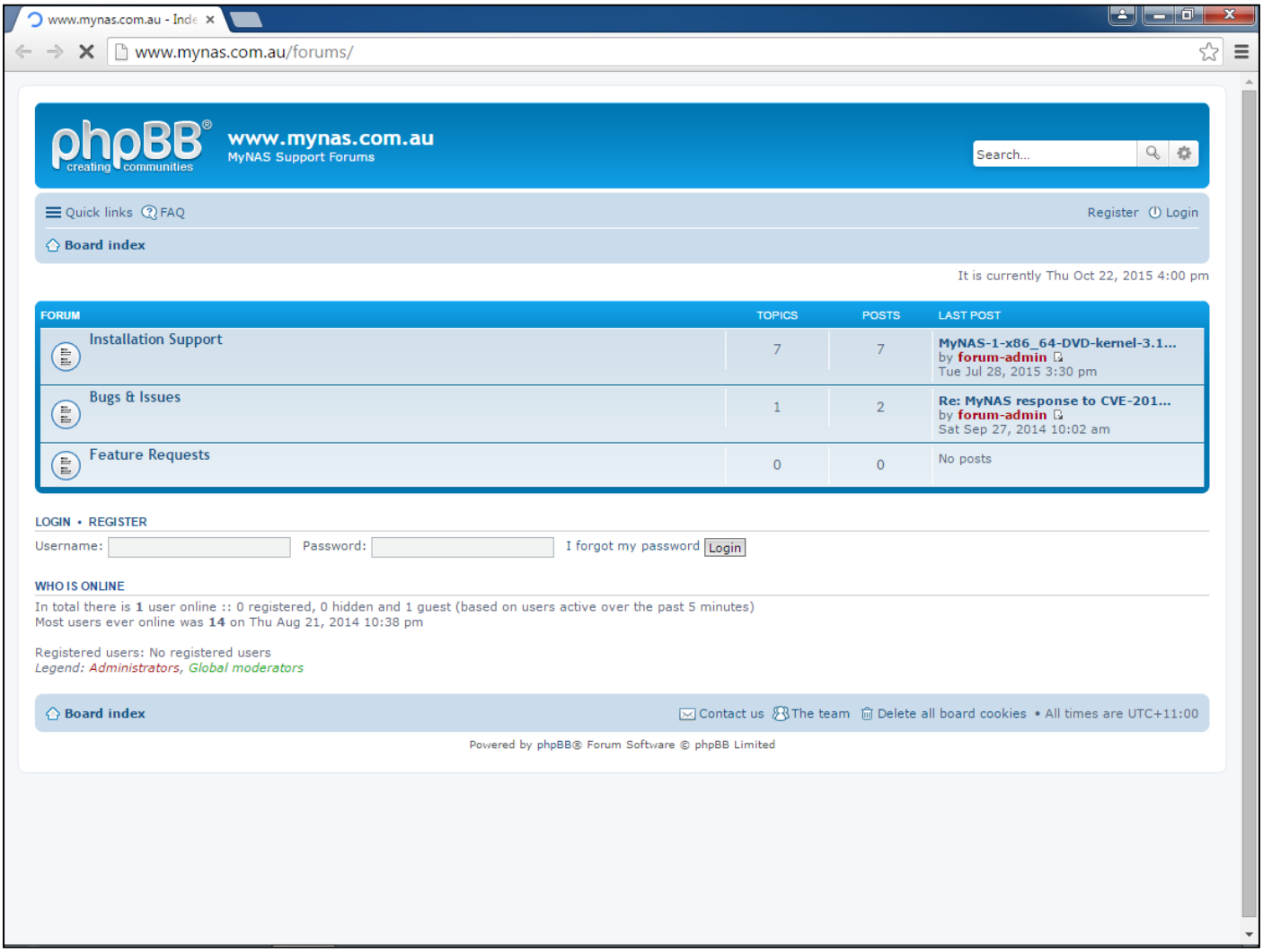
Alternatively, if you wish to email MyNAS support directly, send your email to:

support@mynas.com.au

Support via the MyNAS Support Forums

Clicking on the second link 'MyNAS Support Forums', this will open a new browser page to the MyNAS support forums.

Register as a new user and submit your support request or feature request in the appropriate location.



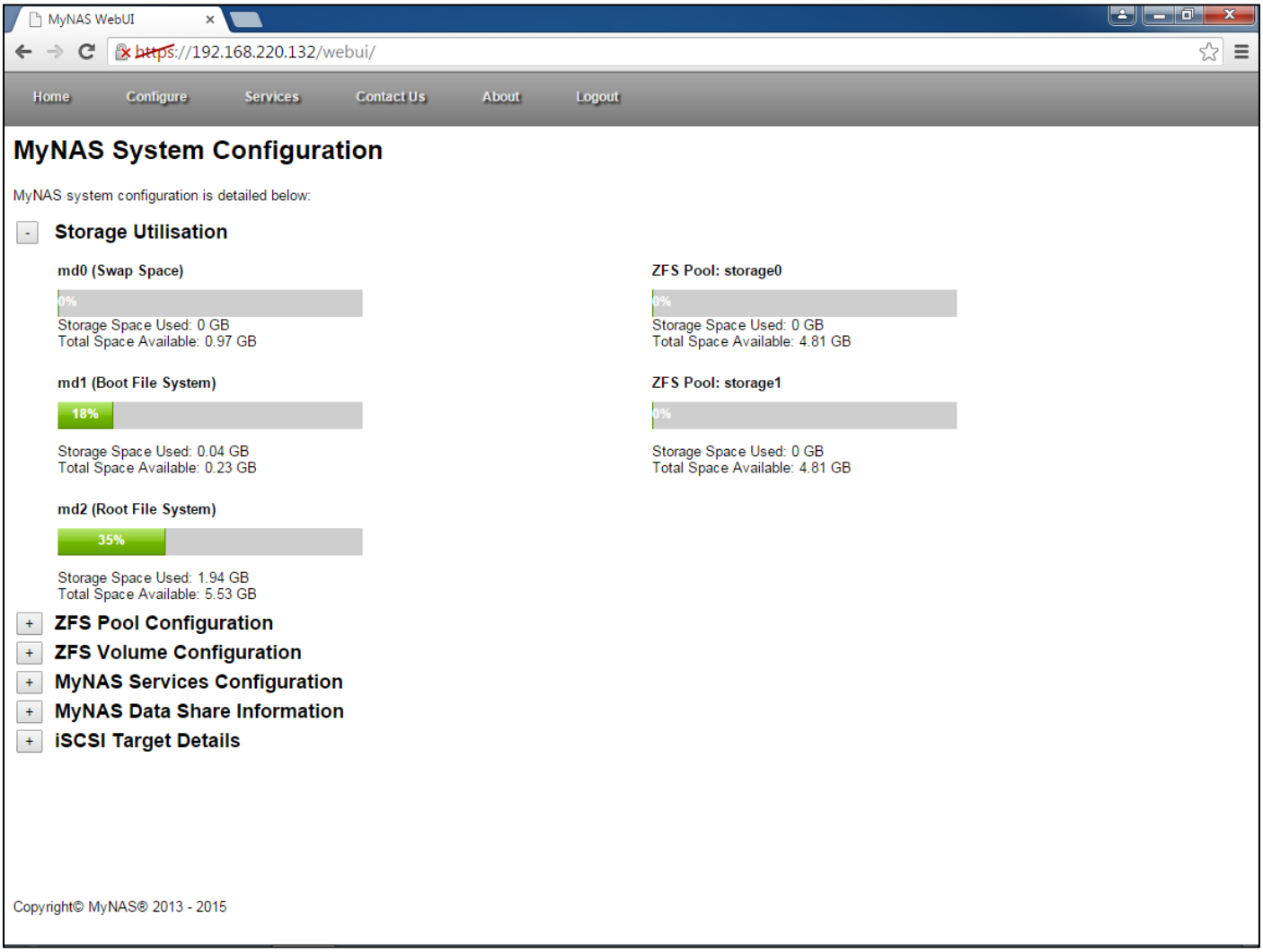
MyNAS System and Performance Information

MyNAS provides an insight to the performance of your hardware when running MyNAS. To look at the performance information, login to the WebUI as either the 'admin' or 'enable' user, and under the 'About' menu item there are the following menu items:

System Configuration

This item provides the following details in regards to your MyNAS installation:

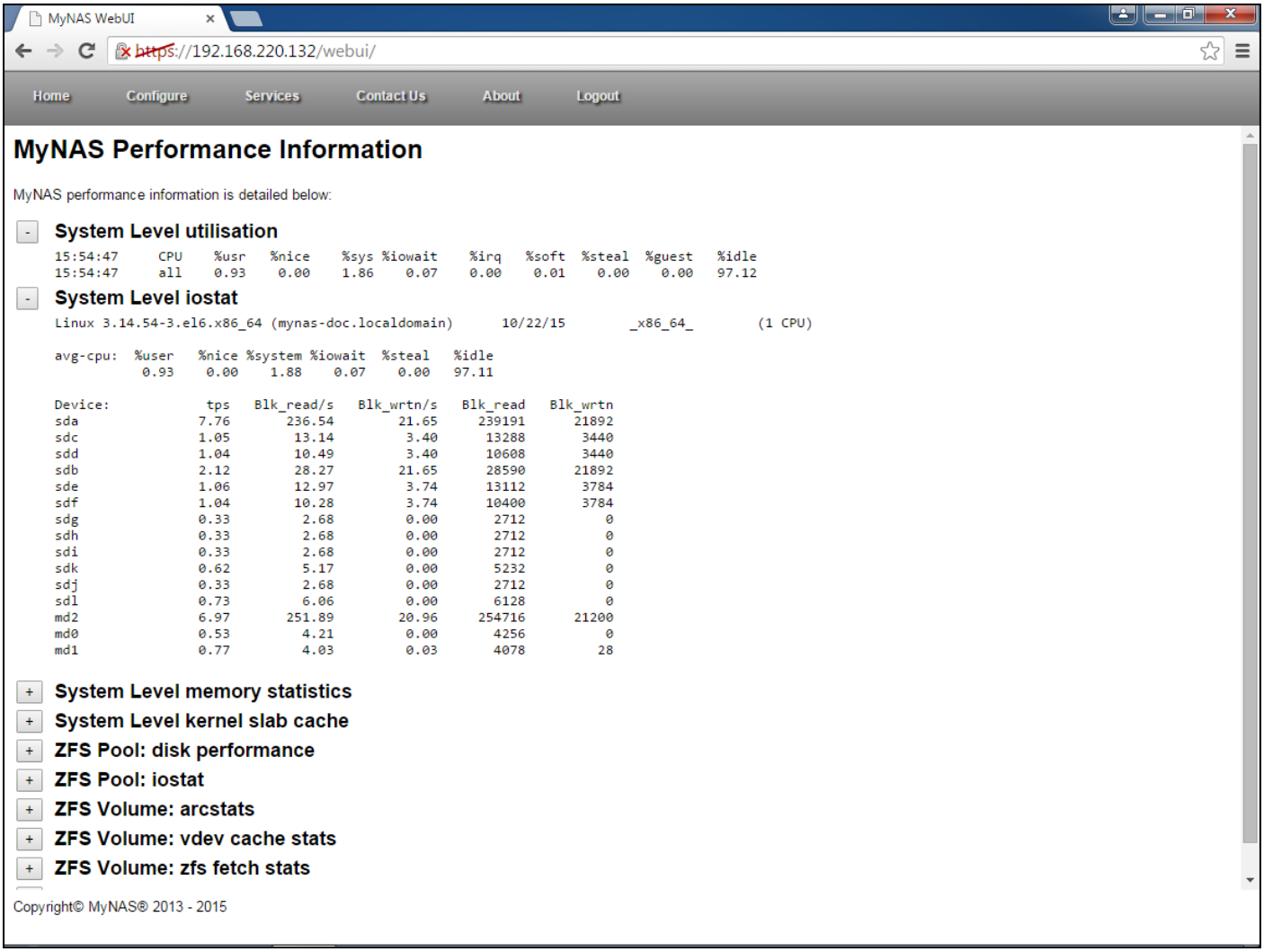
- Storage Utilisation
- ZFS Pool Configuration
- ZFS Volume Configuration
- MyNAS Services Configuration
- Data Share Information
- iSCSI Target Details



Performance Information

This item provides information around the following performance items for MyNAS:

- System Level utilisation
- System Level iostat
- System Level memory statistics
- System Level kernel slab cache
- ZFS Pool disk performance
- ZFS Pool iostat
- ZFS Volume arcstats
- ZFS Volume vdev cache fetch stats
- ZFS Volume zfs fetch stats
- ZFS Volume zfs zil stats



Performance benchmarking your MyNAS Installation

Several tools are available for benchmarking NAS installs. Two of the most popular are:

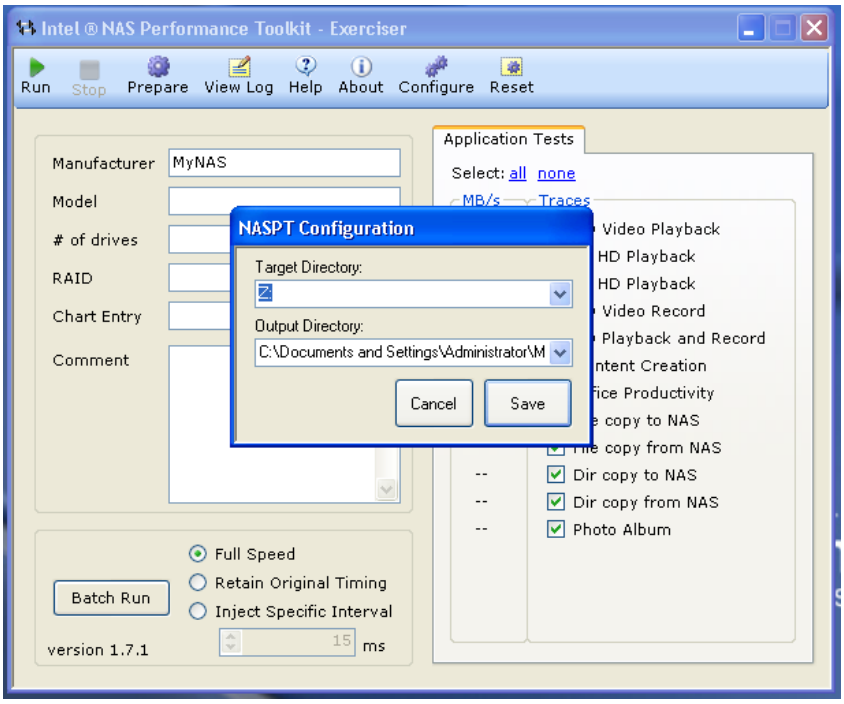
1. Intel NAS Performance Benchmark Toolkit
   Downloadable from http://www.intel.com/content/www/us/en/storage/nas-performance-toolkit.html
2. CrystalDiskMark
   Downloadable from http://crystalmark.info/software/CrystalDiskMark/index-e.html

To perform a performance benchmark, first map a network drive from MyNAS to your computer.

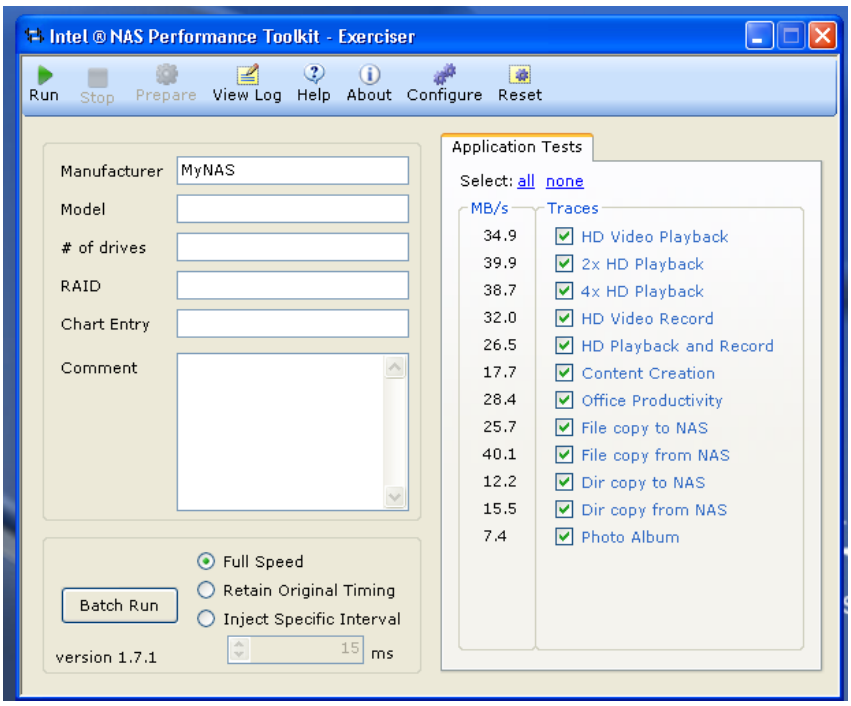
Note: All performance benchmarking is highly subjective to what your actual hardware is. Performance will vary based on the disk, CPU and the network being used.

Intel NAS Performance Toolkit

Once the toolkit is installed, configure the tool to use the mapped network drive as the target directory:



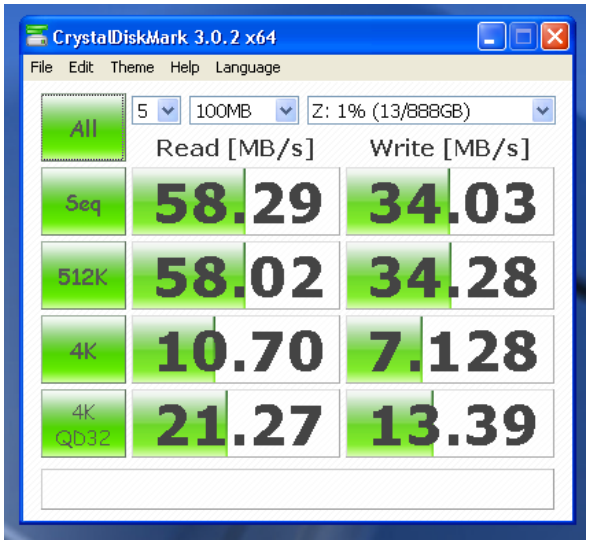
Configure all Application tests, then click the Run button. After running the tests, the performance results will be displayed



Note: The higher the numbers the better

CrystalDiskMark

Point the tool at the mapped drive. Once selected, click the All button to execute all tests against the mapped network drive. Once the benchmarking is complete, you will have some values which can detail how your MyNAS install performs under certain scenarios as illustrated below:

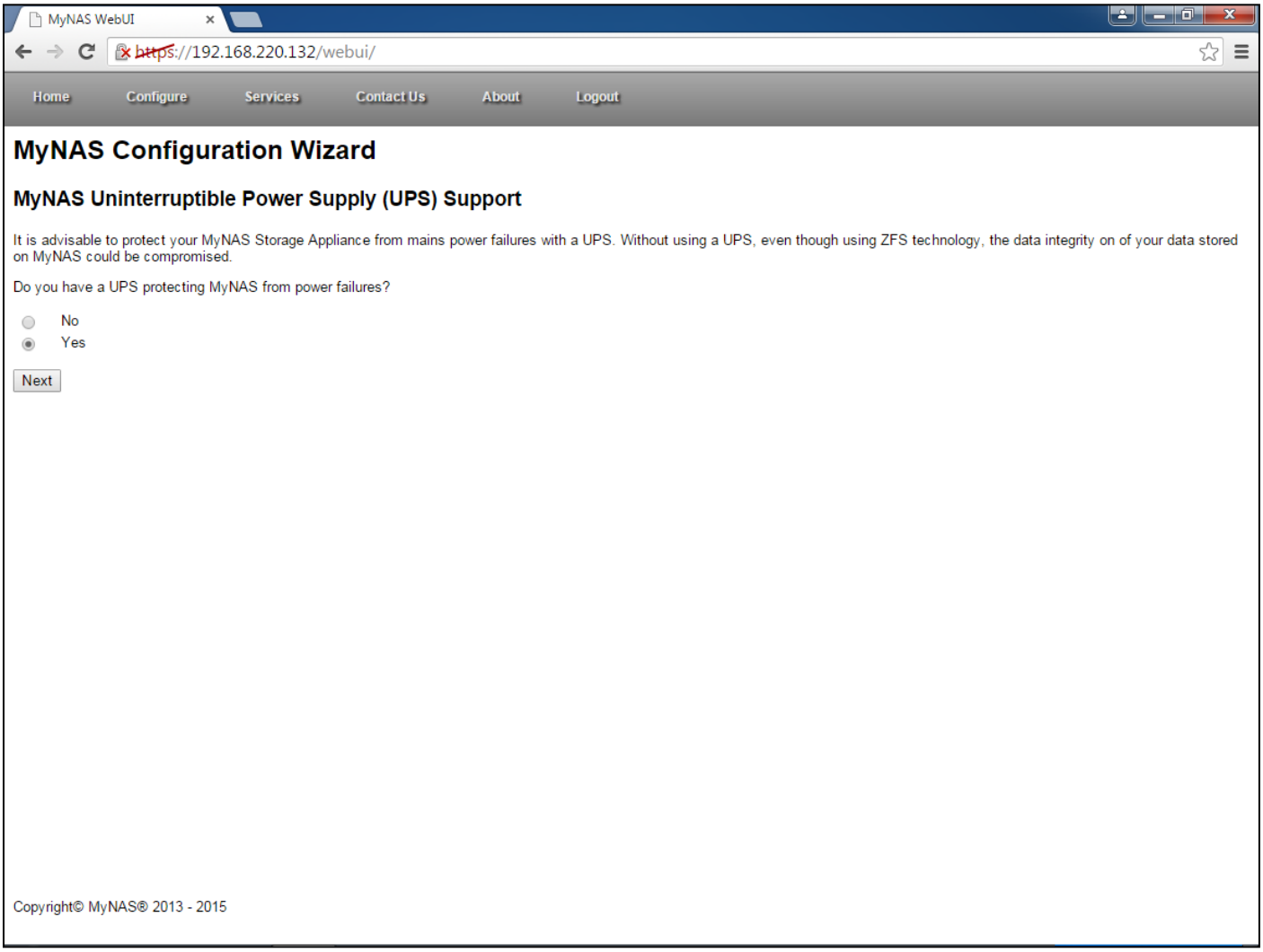


Note: The higher the numbers the better

MyNAS Storage Appliance UPS Support

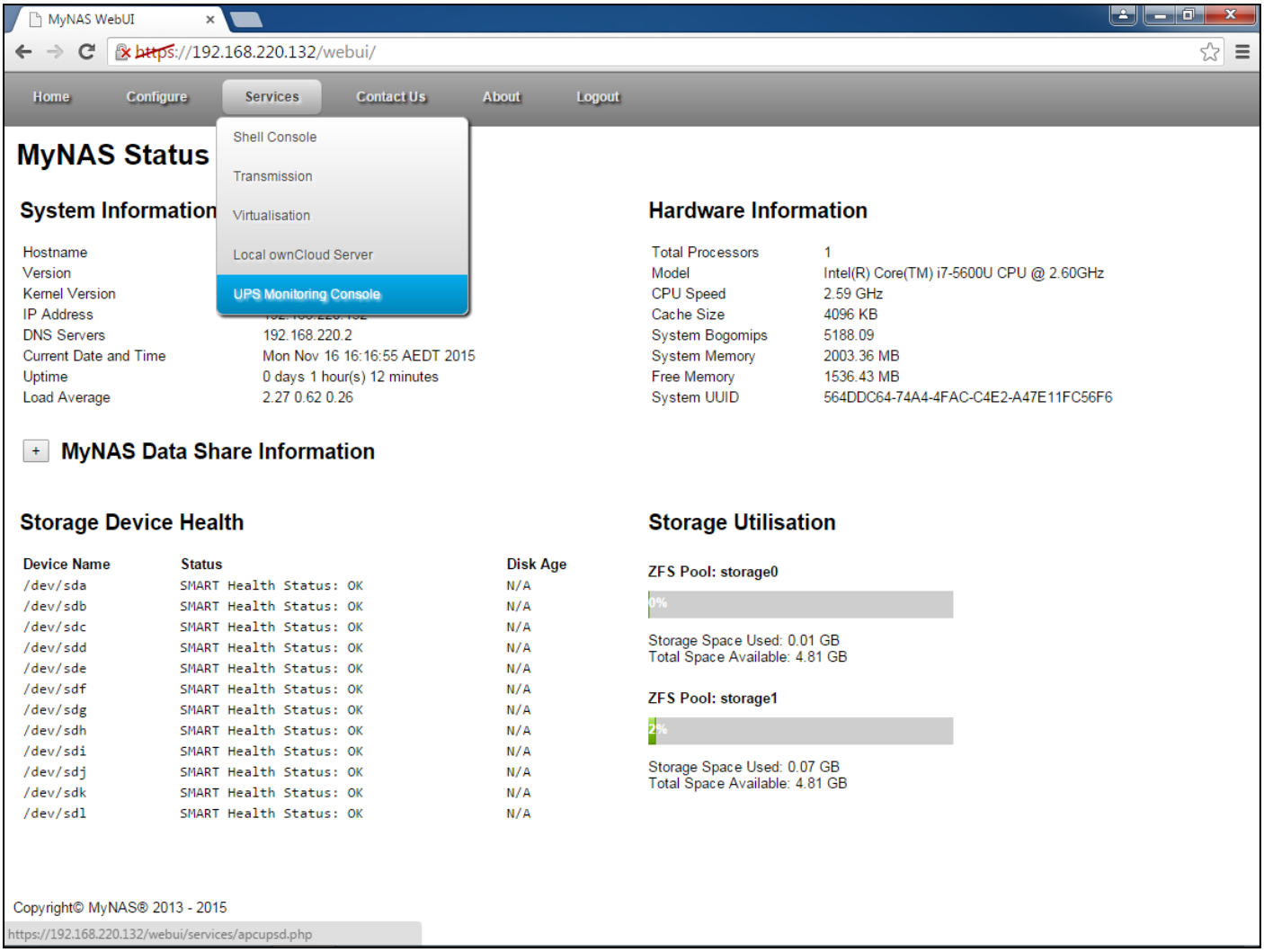
MyNAS Storage Appliance supports safe shutdown capabilities when a UPS is used in conjunction with the hardware that is being used for your MyNAS Storage Appliance.

During the Initial Setup Wizard, you configure this support by selecting the appropriate option as shown below:



Once configured, you will receive email alerts regarding the operational status of your UPS.

MyNAS also provides a graphical view of your UPS. To access this, select 'Services' from the menu bar and click 'UPS Monitoring Console':



This will bring up the UPS Monitoring Console detailing elements regarding your UPS:

UPS devices that have been test are:

- Standard USB connected UPS
- APC USB connected UPS

MyNAS Admin User Command Line Interface (CLI) Reference

The admin role provides essentially "read only" access to the MyNAS appliance to provide information as to the current state of various settings. At the admin root level, the following commands are available:

```
>
  enable  Enter MyNAS CLI privileged execution mode
  exit    Exit MyNAS CLI
  show    Show MyNAS current system information
  whoami  Display current user name

>
```

The below list of commands provides the details of what information is available at this privilege level.

Command Name	Command Description	Command Example

`enable`	Change to the "enable" access mode to configure MyNAS from the CLI	`> enable`
		`Password: <type in the enable password>`
		
		`Entering MyNAS CLI privileged execution mode...`
		
		`enable#`

`show disk <disk name>`	Show the details of a particular disk attached to the system. The <disk name> input takes valid entries such as:
	• sda
	• sdb
	• sdc
		`> show disk sda`
		`Model: VMware, VMware Virtual S (scsi)`
		`Disk /dev/sda: 10.7GB`
		`Sector size (logical/physical): 512B/512B`
		`Partition Table: msdos`
		
		`Number  Start   End     Size    Type     File system  Flags`
		` 1      1049kB  4296MB  4295MB  primary               raid`
		` 2      4296MB  4558MB  262MB   primary  ext4         boot, raid`
		` 3      4558MB  10.7GB  6179MB  primary               raid`
		
		`>`

Command Name	Command Description	Command Example

`show disks`	Show all the disks attached to the system that are available for use for adding to a ZFS Pool	`> show disks`
		`Available System Disks for ZFS:`
		` sdc`
		` sdd`
		` sde`
		` sdf`
		` sdg`
		` sdh`
		` sdi`
		` sdj`
		` sdk`
		` sdl`
		`>`

`show iscsi targets`	Show all the iSCSI targets as configured on the system currently	`> show iscsi targets`
		`iSCSI Target #1`
		`  Target: iqn.2013-05.au.com.mynas.storage:564d7a75.lun4`
		`  Backing Store: /dev/zvol/green/iscsi/lun4`
		`  Size: 50 GB`
		`  Provision State: Thin`
		
		`>`

`show iscsi targets verbose`	Show all the current iSCSI target details, including all connections, block details and backing store	`> show iscsi targets verbose`
		`Target 1: iqn.2014-11.au.com.mynas.storage:564dcdc2.lun1`
		`    System information:`
		`        Driver: iscsi`
		`        State: ready`
		`    I_T nexus information:`
		`        I_T nexus: 1`
		`            Initiator: iqn.1991-05.com.microsoft:ABCD-ABCD alias: none`
		`            Connection: 1`
		`                IP Address: 192.168.153.170`
		`        I_T nexus: 2`
		`            Initiator: iqn.1991-05.com.microsoft:EFGH-EFGH alias: none`
		`            Connection: 1`
		`                IP Address: 192.168.153.1`
		`    LUN information:`
		`        LUN: 0`
		`            Type: controller`
		`            SCSI ID: MyNAS     00010000`
		`    ....`
		`>`

Command Name	Command Description	Command Example

`show kernel messages`	Show the kernel messages log when the MyNAS appliance was booting
	
	This command also supports CTRL-C to cancel out of viewing the log file.
		`> show kernel messages`
		`Initializing cgroup subsys cpuset`
		`Initializing cgroup subsys cpu`
		`Linux version 3.7.10-6.el6.x86_64 (mockbuild@localhost.localdomain) (gcc version 4.4.6 20120305 (Red Hat 4.4.6-4) (GCC) ) #1 SMP We d May 22 15:34:43 EST 2013`
		`Command line: ro root=UUID=c8d312d1-258e-4cc6-b09c-c239f02ec09a rd_NO_LUKS KEYBOARDTYPE=pc KEYTABLE=us LANG=en_US.UTF-8 rd_MD_UUID =7f4f5aa4:0978a4b6:625f733e:1974a468 SYSFONT=latarcyrheb-sun16 crashkernel=auto rd_NO_LVM rd_MD_UUID=2b986a70:8d2767b1:e3c13a47:237 01874 rd_NO_DM rhgb quiet`
		`Disabled fast string operations`
		`e820: BIOS-provided physical RAM map:`
		`BIOS-e820: [mem 0x0000000000000000-0x000000000009f7ff] usable`
		`BIOS-e820: [mem 0x000000000009f800-0x000000000009ffff] reserved`
		`BIOS-e820: [mem 0x00000000000ca000-0x00000000000cbfff] reserved`
		`.........`
		`>`

`show kernel modules`	Show the kernel modules loaded for the system supporting the hardware as detected.
	
	This command also supports CTRL-C to cancel out of viewing the log file.
		`> show kernel modules`
		`Module Size Used by`
		`nls_utf8 1390 0`
		`ipv6 336565 27`
		`ppdev 8183 0`
		`zfs 1088908 9`
		`zcommon 44466 1 zfs`
		`znvpair 74101 2 zfs,zcommon`
		`zavl 6900 1 zfs`
		`.........`
		`>`

`show kernel parameters`	Show the configured kernel parameters used to configure kernel runtime settings
	
	This command also supports CTRL-C to cancel out of viewing the log file.
		`> show kernel parameters`
		`abi.vsyscall32 = 1`
		`debug.exception-trace = 1`
		`debug.kprobes-optimization = 1`
		`dev.cdrom.autoclose = 1`
		`dev.cdrom.autoeject = 0`
		`dev.cdrom.check_media = 0`
		`dev.cdrom.debug = 0`
		`.........`
		`>`

`show data shares active`	Show all currently configured Samba share's the MyNAS appliance is serving	`> show samba active shares`
		`SHARE NAME SHARE COMMENT`
		`\\MYTESTSVR\archive_for_iscsi_lun2 iSCSI Archive for lun2`
		`>`

Command Name	Command Description	Command Example
show data shares available	Show all available Samba shares configured, but not currently shared / active	> show samba available shares SHARE NAME SHARE COMMENT archive_for_iscsi_lun3 iSCSI Archive for lun3 backup_for_iscsi_lun4 iSCSI Backup for lun4 >
show data shares status	Show the current status of Samba on the MyNAS appliance.	> show samba status Samba version 4.2.4 PID Username Group Machine Protocol Version --- Service pid machine Connected at --- No locked files >
show service status apcupsd	Show the status of the UPS Monitoring service	> show service status apcupsd apcupsd (pid 14413) is running... >
show service status crond	Show the status of the crond service	> show service status crond crond (pid 4875) is running... >
show service status dropbox	Show the status of the dropbox service	> show service status dropbox dropboxd for USER dropbox: not running. >
show service status httpd	Show the status of the httpd service	> show service status httpd httpd (pid 4018) is running... >
show service status iptables	Show the status of the iptables service	> show service status iptables iptables: Firewall is not running. >
show service status mdmonitor	Show the status of the mdmonitor service	> show service status mdmonitor mdmonitor (pid 1306) is running... >
show service status minidlna	Show the status of the minidlna service	> show service status minidlna minidlna is stopped >
show service status mysqld	Show the status of the mysqld service	> show service status mysqld mysqld (pid 1856) is running... >
show service status netfs	Show the status of the netfs service	> show service status netfs >
show service status nfslock	Show the status of the nfslock service	> show service status nfslock rpc.statd is stopped >

Command Name	Command Description	Command Example
show service status network	Show the status of the network service	> show service status network Configured devices: lo eth0 Currently active devices: lo eth0 >
show service status nfs	Show the status of the nfs service	> show service status nfs rpc.svcgssd is stopped rpc.mountd is stopped nfsd is stopped >
show service status nfslock	Show the status of the nfslock service	> show service status nfslock rpc.statd is stopped >
show service status nmb	Show the status of the nmb service	> show service status nmb nmbd (pid 4036) is running... >
show service status ntpd	Show the status of the ntpd service	> show service status ntpd ntpd (pid 3508) is running... >
show service status postfix	Show the status of the postfix service	> show service status postfix master (pid 4008) is running... >
show service status rsyslog	Show the status of the rsyslog service	> show service status rsyslog rsyslogd (pid 3329) is running... >
show service status samba	Show the status of the samba service	> show service status samba smbd (pid 4064 4045) is running... >
show service status smartd	Show the status of the smartd service	> show service status smartd smartd is stopped >
show service status smb	Show the status of the smb service	> show service status smb smbd (pid 4064 4045) is running... >
show service status sshd	Show the status of the sshd service	> show service status sshd openssh-daemon (pid 3500) is running... >
show service status sysstat	Show the status of the sysstat service	> show service status sysstat >
show service status tgtd	Show the status of the tgtd service	> show service status tgtd tgtd (pid 3458 3457) is running... >
show service status xen-watchdog	Show the status of the xen-watchdog service	> show service status xen-watchdog >

Command Name	Command Description	Command Example
`show service status xenconsoled`	Show the status of the xenconsoled service	`> show service status xenconsoled` `>`
`show service status xend`	Show the status of the xend service	`> show service status xend` `>`
`show service status xendomains`	Show the status of the xendomains service	`> show service status xendomains` `>`
`show service status xenstored`	Show the status of the xenstored service	`> show service status xenstored` `>`

`show service status zfs`	Show the status of the zfs service	`> show service status zfs`
		`no pools available`
		
		`no datasets available`
		`>`

`show system datetime`	Show the current system date and time	`> show system datetime`
		`Tue May 28 10:53:27 EST 2013`
		`>`

`show system disk-health`	Show the physical disk health as reported by smartctl	`> show system disk-health`
		`enable# show system disk-health`
		`Disk Serial Number Smart Status`
		`==========`
		`/dev/sda No Serial Number SMART Health Status: OK`
		`/dev/sdb No Serial Number SMART Health Status: OK`
		`/dev/sdc No Serial Number SMART Health Status: OK`
		`/dev/sdd No Serial Number SMART Health Status: OK`
		`enable# >`
		
		`> show system disk-health`
		`Disk Serial Number Smart Status`
		`==========`
		`/dev/sda 5VJ755CJ SMART overall-health self-assessment test result: PASSED`
		`/dev/sdb W627CR0W SMART overall-health self-assessment test result: PASSED`
		`/dev/sdc 9QJ4EW5X SMART overall-health self-assessment test result: PASSED`
		`/dev/sdd 9QJ4F71T SMART overall-health self-assessment test result: PASSED`
		`>`

`show system hostname`	Show the current configured hostname	`> show system hostname`
		`mytestsvr.network.zzz`
		`>`

Command Name	Command Description	Command Example
show system iostat		> show system iostat Linux 3.7.10-6.el6.x86_64 (mytestsvr.network.zzz) 05/28/2013 _x86_64_ (1 CPU) avg-cpu: %user %nice %system %iowait %steal %idle 0.68 0.00 0.97 0.22 0.00 98.14 Device: tps Blk_read/s Blk_wrtn/s Blk_read Blk_wrtn sdc 0.35 19.18 9.62 674832 338392 sdb 0.52 1.29 2.33 45251 81844 sda 0.64 6.27 2.33 220789 81844 sdd 0.34 18.78 9.62 660784 338600 sde 0.34 17.77 9.63 625304 338832 sdf 0.33 16.66 9.65 586104 339624 sdg 0.34 18.14 9.63 638232 338960 sdh 0.01 0.08 0.00 2896 0 sdi 0.01 0.08 0.00 2896 0 sdj 0.01 0.08 0.00 2896 0 sdk 0.01 0.08 0.00 2896 0 sdl 0.01 0.08 0.00 2896 0 md0 0.01 0.10 0.00 3600 0 md2 0.38 7.24 1.87 254796 65936 md1 0.01 0.10 0.00 3412 18 zd0 0.17 31.08 16.27 1093696 572400 >
show system ip address	Show the current system configured IP addresses	> show system ip addresses 1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00 inet 127.0.0.1/8 scope host lo inet6 ::1/128 scope host valid_lft forever preferred_lft forever 2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000 link/ether 00:0c:29:92:7a:ae brd ff:ff:ff:ff:ff:ff inet 192.168.153.128/24 brd 192.168.153.255 scope global eth0 inet6 fe80::20c:29ff:fe92:7aae/64 scope link valid_lft forever preferred_lft forever >
show system ip route	Show the current system IP routing information	> show system ip route Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 192.168.153.2 0.0.0.0 UG 0 0 0 eth0 192.168.153.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0 >

Command Name	Command Description	Command Example
show system memory	Show the current system memory utilisation	> show system memory total used free shared buffers cached Mem: 996 695 301 0 191 50 Low: 996 695 301 High: 0 0 0 -/+ buffers/cache: 452 543 Swap: 4094 0 4094 >
show system memory statistics	Show the current system memory statistics	> show system memory statistics procs -----------memory---------- ---swap-- -----io---- --system-- -----cpu----- r b swpd free inact active si so bi bo in cs us sy id wa st 0 0 0 301 284 47 0 0 80 33 33 76 1 1 98 0 0 >
show system memory table	Show the current system memory table	> show system memory table 996 M total memory 695 M used memory 47 M active memory 284 M inactive memory 301 M free memory 191 M buffer memory 50 M swap cache 4094 M total swap 0 M used swap 4094 M free swap 23935 non-nice user cpu ticks 4 nice user cpu ticks 32543 system cpu ticks 3490275 idle cpu ticks 7585 IO-wait cpu ticks 9 IRQ cpu ticks 1502 softirq cpu ticks 0 stolen cpu ticks 2822208 pages paged in 1182707 pages paged out 0 pages swapped in 0 pages swapped out 1163367 interrupts 2717662 CPU context switches 1369612356 boot time 7151 forks >
show system nethogs	Show network traffic and their processes	11690 root sshd: root@pts/0 eth0 1.018 0.117 KB/sec ? root unknown TCP 0.000 0.000 KB/sec

Command Name	Command Description	Command Example

`show system network connections`	Show all the current active connections to the MyNAS appliance	`> show system network connections`
		`Active Internet connections (servers and established)`
		`Proto Recv-Q Send-Q Local Address Foreign Address State PID/Program name`
		`tcp 0 0 0.0.0.0:445 0.0.0.0:* LISTEN 4045/smbd`
		`tcp 0 0 127.0.0.1:3306 0.0.0.0:* LISTEN 3875/mysqld`
		`tcp 0 0 0.0.0.0:139 0.0.0.0:* LISTEN 4045/smbd`
		`tcp 0 0 0.0.0.0:22 0.0.0.0:* LISTEN 3500/sshd`
		`tcp 0 0 127.0.0.1:25 0.0.0.0:* LISTEN 4008/master`
		`tcp 0 0 0.0.0.0:3260 0.0.0.0:* LISTEN 3457/tgtd`
		`tcp 0 0 192.168.153.128:3260 192.168.153.1:44793 ESTABLISHED 3457/tgtd`
		`tcp 0 0 192.168.153.128:22 192.168.153.1:45336 ESTABLISHED 6467/sshd`
		`tcp 0 0 :::445 :::* LISTEN 4045/smbd`
		`tcp 0 0 :::139 :::* LISTEN 4045/smbd`
		`tcp 0 0 :::80 :::* LISTEN 4018/httpd`
		`tcp 0 0 :::22 :::* LISTEN 3500/sshd`
		`tcp 0 0 ::1:25 :::* LISTEN 4008/master`
		`tcp 0 0 :::3260 :::* LISTEN 3457/tgtd`
		`>`

`show system network dns`	Show the configured network DNS servers	`> show system network dns`
		`nameserver 8.8.8.8`
		`nameserver 8.8.4.4`
		`>`

`show system network interface <interface-name>`	Show the details of a particular network interface. The <id> input takes valid entries such as:
	• eth0
	• ethX
	• lo
	• bon0
		`> show system network interface eth0`
		`eth0 Link encap:Ethernet HWaddr 00:0C:29:92:7A:AE`
		`inet addr:192.168.153.128 Bcast:192.168.153.255 Mask:255.255.255.0`
		`inet6 addr: fe80::20c:29ff:fe92:7aae/64 Scope:Link`
		`UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1`
		`RX packets:210181 errors:0 dropped:0 overruns:0 frame:0`
		`TX packets:12608 errors:0 dropped:0 overruns:0 carrier:0`
		`collisions:0 txqueuelen:1000`
		`RX bytes:306156784 (291.9 MiB) TX bytes:2872442 (2.7 MiB)`
		
		`>`

`show system network interfaces`	Show all the network interfaces as configured in the MyNAS appliance	`> show system network interfaces`
		`1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN`
		`link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00`
		`2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000`
		`link/ether 00:0c:29:92:7a:ae brd ff:ff:ff:ff:ff:ff`
		`>`

`show system notifications address`	Show the current configured system notification address used for sending administrative information about the MyNAS appliance	`> show system notifications address`
		`No email address configured. Set notification email address`
		`using the command: configure system notifications <email-address>`
		`>`

Command Name	Command Description	Command Example

`show system notifications smarthost`	Show the current configured smart host address used for sending administrative information about the MyNAS appliance	`> show system notifications smarthost`
		`System notifications smarthost: mail.myisp.net`
		`>`

`show system ntp servers`	Show the current configured system NTP servers for the MyNAS appliance	`> show system ntp servers`
		`server 0.centos.pool.ntp.org`
		`server 1.centos.pool.ntp.org`
		`server 2.centos.pool.ntp.org`
		`>`

`show system ntp time-sync`	Show the current configured system NTP time synchronisation for the MyNAS appliance	`> show system ntp time-sync`
		`remote refid st t when poll reach delay offset jitter`
		`==============================================================================`
		`+128.184.34.53 169.254.0.1 4 u 382 512 137 8.706 -102.33 124.901`
		`+121.0.0.42 216.218.254.202 2 u 383 512 377 31.243 14.980 3.193`
		`*27.54.95.11 218.100.43.70 2 u 485 512 377 44.712 1.241 3.723`
		`>`

`show system timezone`	Show the current configured timezone of the MyNAS appliance	`> show system timezone`
		`Timezone: Australia/Melbourne`
		`>`

`show system updates`	Show any available system updates for the MyNAS appliance	`> show system updates`
		
		`There are no MyNAS Storage Appliance Updates at this time`
		
		`>`
		
		`> show system updates`
		
		`logrotate.x86_64 3.7.8-17.el6 MyNAS`
		
		`>`

`show system uptime`	Show the current system uptime of the MyNAS appliance	`> show system uptime`
		`11:16:04 up 1 day, 1:23, 1 user, load average: 0.00, 0.02, 0.05`
		`>`

`show system utilisation`	Show the current CPU utilisatoin of the MyNAS appliance	`> show system utilisation`
		`11:17:23 AM CPU %usr %nice %sys %iowait %irq %soft %steal %guest %idle`
		`11:17:23 AM all 0.66 0.00 0.90 0.21 0.00 0.04 0.00 0.00 98.20`
		`>`

`show system version`	Show the current system version of the MyNAS appliance	`> show system version`
		`Operating System: MyNAS Release 1.3 (Yarra)`
		`Kernel Version: 3.14.56-2.el6.x86_64`
		`>`

Command Name	Command Description	Command Example
show vdev	Show the configured vdev devices utilised by the MyNAS appliance to configure the ZFS Pool's	> show vdev alias disk_sdc wwn-0x6000c298be3a741f805e2c0843b2e548 alias disk_sdd wwn-0x6000c29fcbd828ea810778318a8dd247 alias disk_sde wwn-0x6000c2995cc9aa650588297ab44f2be9 alias disk_sdf wwn-0x6000c292f764b6427ca3e17973318677 alias disk_sdg wwn-0x6000c2978f7e068647848bcbc176bccc alias disk_sdh wwn-0x6000c29d561fc7b5a50b41ae1b846170 alias disk_sdi wwn-0x6000c295d8a746f37a9f6f8bed988644 alias disk_sdj wwn-0x6000c2910e99bbec43a9bed1dd30b582 alias disk_sdk wwn-0x6000c2966c471b06f1bb0f37140b28d8 alias disk_sdl wwn-0x6000c29494719c5ea43aa0aba5256b79 >
show zfs arcstats	Show the ZFS arcstats details	> show zfs arcstats 4 1 0x01 80 3840 58658632981 295322500527220 name type data hits 4 328135 misses 4 25230 demand_data_hits 4 11225 demand_data_misses 4 291 demand_metadata_hits 4 291355 demand_metadata_misses 4 758 prefetch_data_hits 4 25152 ..... >
show zfs vdev_cache_stats	Show the ZFS arcstats details	> show zfs vdev_cache_stats name type data delegations 4 0 hits 4 0 misses 4 0 >
show zfs zfetchstats	Show the ZFS zfetchstats details	> show zfs zfetchstats name type data hits 4 364441 misses 4 496 colinear_hits 4 18 colinear_misses 4 478 stride_hits 4 356099 stride_misses 4 5 reclaim_successes 4 201 reclaim_failures 4 277 streams_resets 4 82 streams_noresets 4 8342 bogus_streams 4 0 >

Command Name	Command Description	Command Example
show zfs zilstats	Show the ZFS zilstats details	> show zfs zilstats name type data zil_commit_count 4 167 zil_commit_writer_count 4 167 zil_itx_count 4 3981 zil_itx_indirect_count 4 3334 zil_itx_indirect_bytes 4 218497024 zil_itx_copied_count 4 0 zil_itx_copied_bytes 4 0 zil_itx_needcopy_count 4 647 zil_itx_needcopy_bytes 4 43494672 zil_itx_metaslab_normal_count 4 0 zil_itx_metaslab_normal_bytes 4 0 zil_itx_metaslab_slog_count 4 548 zil_itx_metaslab_slog_bytes 4 44359856 >
show zfs volumes	Show all the configured ZFS Volumes as configured on the MyNAS appliance	> show zfs volumes NAME USED AVAIL REFER MOUNTPOINT green 1.56G 156G 256K /green green/archive 462M 156G 256K /green/archive green/archive/iscsi_lun1_20130523100322 116M 156G 116M /green/archive/iscsi_lun1_20130523100322 green/archive/iscsi_lun2_20130523102105 116M 156G 116M /green/archive/iscsi_lun2_20130523102105 green/archive/iscsi_lun3_20130524114205 229M 156G 229M /green/archive/iscsi_lun3_20130524114205 green/backup 513M 156G 230K /green/backup green/backup/iscsi_lun4 513M 156G 513M /green/backup/iscsi_lun4 green/iscsi 618M 156G 217K /green/iscsi green/iscsi/lun4 618M 156G 618M - >
show zpool iostat	Show the performance of the configured zpool	> show zpool iostat capacity operations bandwidth pool alloc free read write read write ---------- ----- ----- ----- ----- ----- ----- green 984M 198G 0 0 17.0K 6.09K raidz1 984M 198G 0 0 17.0K 6.09K disk_sdc - - 0 0 3.65K 1.84K disk_sdd - - 0 0 3.58K 1.84K disk_sde - - 0 0 3.38K 1.85K disk_sdf - - 0 0 3.17K 1.85K disk_sdg - - 0 0 3.45K 1.85K ---------- ----- ----- ----- ----- ----- ----- >
show zpool list	Show all the configured ZFS zpool's within the MyNAS appliance	> show zpool list NAME SIZE ALLOC FREE CAP DEDUP HEALTH ALTROOT green 199G 984M 198G 0% 6.12x ONLINE - >

Command Name	Command Description	Command Example

show zpool status	Show the status of all configured zpools within the MyNAS appliance	> show zpool status
		  pool: green
		 state: ONLINE
		  scan: none requested
		config:
		
		NAME STATE READ WRITE CKSUM
		green ONLINE 0 0 0
		raidz1-0 ONLINE 0 0 0
		disk_sdc ONLINE 0 0 0
		disk_sdd ONLINE 0 0 0
		disk_sde ONLINE 0 0 0
		disk_sdf ONLINE 0 0 0
		disk_sdg ONLINE 0 0 0
		
		errors: No known data errors
		>

MyNAS Enable User Command Line Interface (CLI) Reference

The previous 'admin' role CLI reference essentially provides a read only "configuration" access to the MyNAS Storage Appliance. This privilege level is not root or super user access.

At the enable privilege access level, the following commands are available which allow limited configuration of the MyNAS Storage Appliance:

```
enable#
  configure  Configure MyNAS System Functionality
  exit       Exit MyNAS CLI privileged execution mode
  poweroff   Poweroff MyNAS
  reboot     Reboot MyNAS
  show       Show MyNAS current system information
  test       Test MyNAS Configuration
  update     Update MyNAS
  whoami     Display current user name
  zpool      ZFS Pool Configuration Commands

enable#
```

The below list of commands provides the details of what can be configured using the CLI at this privilege level. All "admin" level commands are also inherited to the "enable" user.

Command Name	Command Description	Command Example

`configure network interface dhcp <ifname>`	Configure the selected network interface to use DHCP for network settings	`enable# configure network interface dhcp eth0`
		`Reconfiguring the network, please wait ..`
		`enable#`

`configure network interface static <ifname> <ip-address> <subnet-mask> <gateway>`	Configure the selected network interface to use a static setting for network settings	`enable# configure network interface static eth0 192.168.153.128 255.255.255.0 192.168.153.2`
		`Reconfiguring the network, please wait ..`
		`Configure DNS for this system using the command: configure network dns`
		`enable#`

Command Name	Command Description	Command Example
configure system notifications email <your-email-address>	Configure the email address where system notifications will be sent to notify you of system events	enable# configure system notifications email myemail@mydomain.net enable#
configure system notifications smarthost <your-email-address>	Configure the ISP smarthost which will be used to send notification messages through	enable# configure system notifications smarthost mail.myisp.net Configured email smarthost as: mail.myisp.net enable#
configure system notifications sender-address <your-email-address>		
configure system raid offline <disk-name>	Offline a system RAID disk in order to replace it For further usage instructions refer to Appendix B	Refer to Appendix B
configure system raid offline <disk-name>	Online a system RAID disk in order to replace it For further usage instructions refer to Appendix B	Refer to Appendix B
exit	Exit the "enable" configuration mode	enable# exit Exiting MyNAS CLI privileged execution mode... >
poweroff	Poweroff the MyNAS Storage Appliance	enable# poweroff Are you sure you wish to poweroff the system ? y enable# Broadcast message from root@myhostname.mynetwork.net (/dev/pts/1) at 7:43 ... The system is going down for power off NOW!

Command Name	Command Description	Command Example

`reboot`	Reboot the MyNAS Storage Appliance	`enable# reboot`
		`Are you sure you wish to reboot the system ? y`
		`enable#`
		`Broadcast message from root@myhostname.mynetwork.net`
		`(/dev/pts/0) at 7:47 ...`
		
		`The system is going down for reboot NOW!`

`show system crontab`	Show the system crontab details, showing when system jobs on your MyNAS appliance will run	`enable# show system crontab`
		
		`# Example of job definition:`
		`# .---------------- minute (0 - 59)`
		`# |  .------------- hour (0 - 23)`
		`# |  |  .---------- day of month (1 - 31)`
		`# |  |  |  .------- month (1 - 12) OR jan,feb,mar,apr ...`
		`# |  |  |  |  .---- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat`
		`# |  |  |  |  |`
		`# *  *  *  *  * user-name command to be executed`
		`*/5 * * * * root /etc/scripts/zpadmin.pl`
		`0 0 * * 0 root /etc/scripts/zpadmin.pl -scrub`
		`enable#`

`update system`	Update the MyNAS Storage Appliance with any updates which may be applicable
	
	Note: This command is depreciated via WebUI functionality
		`enable# update system`
		`Please use the MyNAS WebUI to update MyNAS.`
		`enable#`

`zpool export <zfs-pool-name>`	Export a ZFS Pool	`enable# zpool export storage0`
		`Are you sure you wish to export the ZFS Pool 'storage0' ? y`
		`enable#`

Command Name	Command Description	Command Example

`zpool import <zfs-pool-name>`	Import a ZFS Pool	`enable# zpool import storage0`
		`Are you sure you wish to import the ZFS Pool 'storage0' ? y`
		`Attempting to import ...`
		`  pool: storage0`
		`  state: ONLINE`
		`  scan: none requested`
		`config:`
		
		`        NAME          STATE     READ WRITE CKSUM`
		`        storage0      ONLINE       0     0     0`
		`          mirror-0    ONLINE       0     0     0`
		`            disk_sdc  ONLINE       0     0     0`
		`            disk_sdd  ONLINE       0     0     0`
		
		`errors: No known data errors`
		`enable#`

`zpool offline <zfs-pool-name> <vdev-name>`	Offline a storage disk to manually replace the disk For further usage instructions refer to Appendix A	`Refer to Appendix A`
`zpool online <zfs-pool-name> <vdev-name>`	Offline a storage disk to manually replace the disk For further usage instructions refer to Appendix A	`Refer to Appendix A`

Appendix A - Replacing a storage disk in MyNAS Storage Appliance

In the event that a storage disk in MyNAS experiences a failure, use the following procedure to replace the disk in the system. For the example below, the following alerts were generated by MyNAS:

```
This message was generated by the smartd daemon running on:

   host name:  mynas
   DNS domain: homenet.net

The following warning/error was logged by the smartd daemon:

Device: /dev/sde [SAT], ATA error count increased from 0 to 174

Device info:
WDC WD40EFRX-68WT0N0, S/N:WD-WCC4E0622969, WWN:5-0014ee-25ee01af0, FW:80.00A80, 4.00 TB

For details see host's SYSLOG.

You can also use the smartctl utility for further investigation.
No additional messages about this problem will be sent.
```

```
pool: storage
 state: DEGRADED
status: One or more devices are faulted in response to persistent errors.
       Sufficient replicas exist for the pool to continue functioning in a
       degraded state.
action: Replace the faulted device, or use 'zpool clear' to mark the device
       repaired.
  scan: scrub repaired 0 in 7h55m with 0 errors on Sun Jun 22 09:55:58 2014
config:

       NAME           STATE     READ WRITE CKSUM
       storage0       DEGRADED     0     0     0
         raidz1-0     DEGRADED     0     0     0
           disk_sdc   ONLINE       0     0     0
           disk_sdd   ONLINE       0     0     0
           disk_sde   FAULTED      0   162     0  too many errors
           disk_sdf   ONLINE       0     0     0

errors: No known data errors
```

Use the following steps to replace a disk (in this case `disk_sde` in the example above) in a ZFS Storage array.

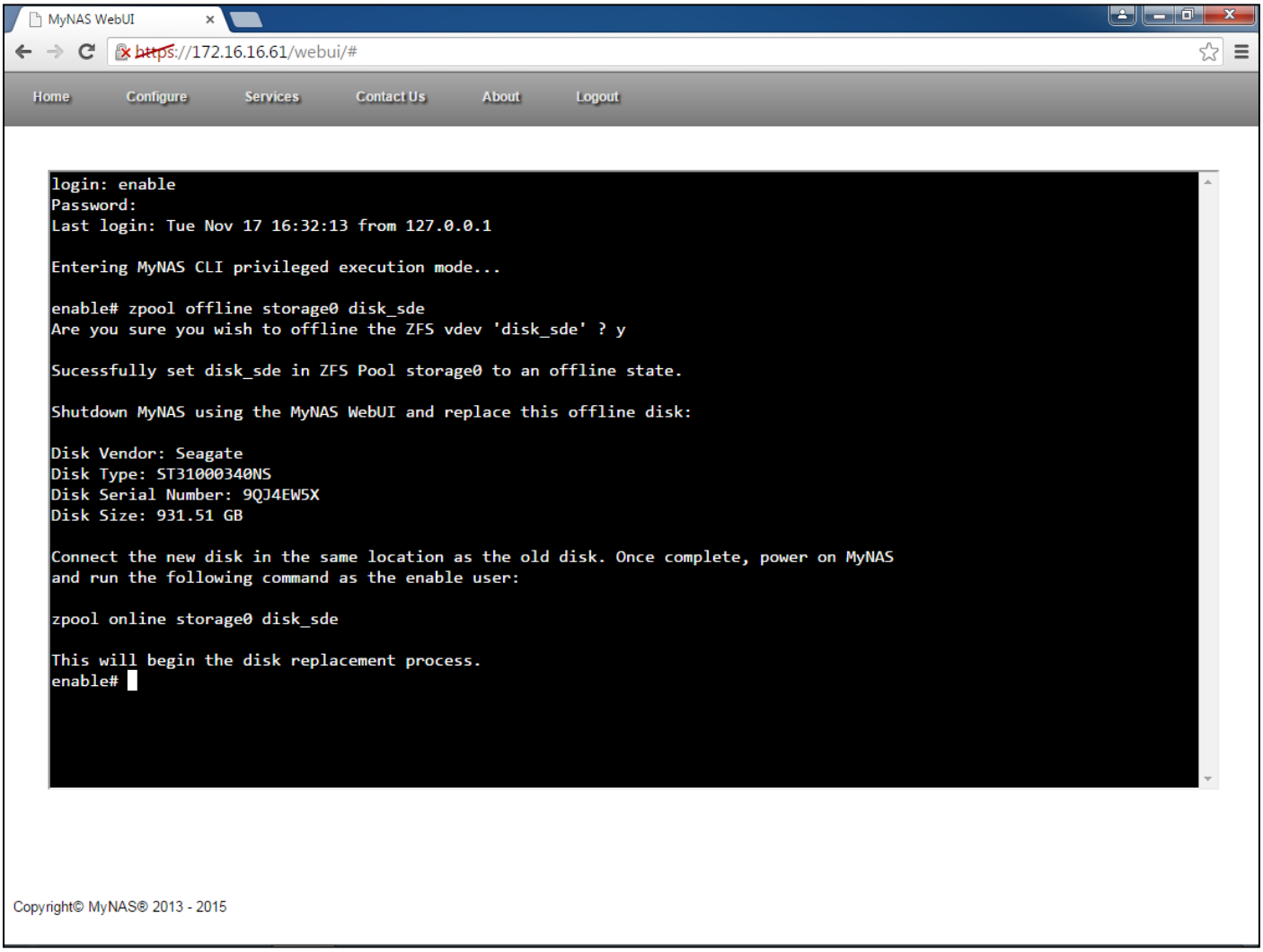
1. Log into the MyNAS CLI via the WebUI as the `enable` user via the WebUI and run the following command:

   ```
   zpool offline <zfs_pool> <disk>
   ```

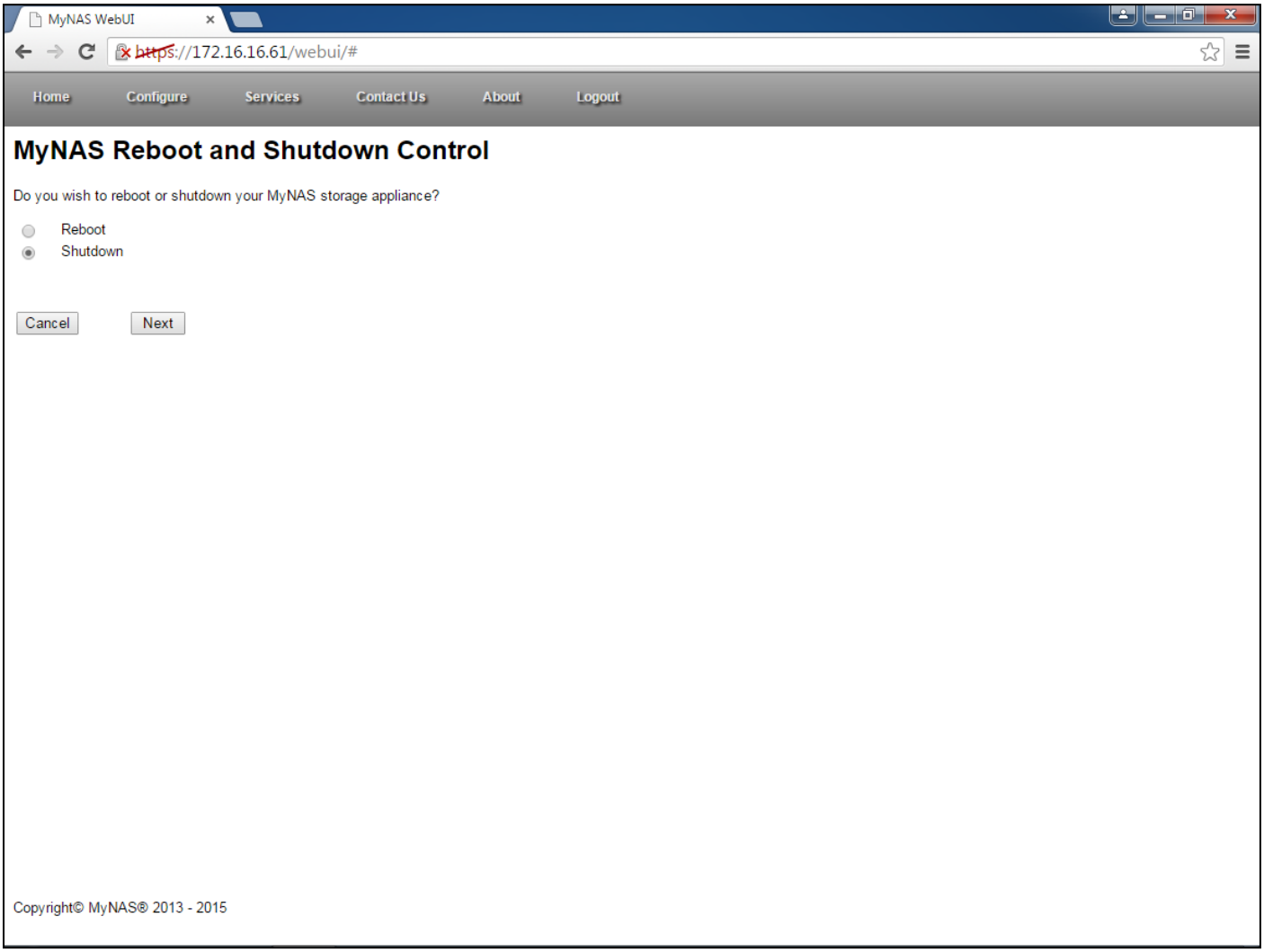
   where, `zfs_pool` equals `storage0` and disk equals `disk_sde` from the example above

   ```
   zpool offline storage0 disk_sde
   ```

   This will set the bad disk to 'offline' within the ZFS pool. This prepares the MyNAS storage appliance for the disk replacement.



2. Power off your MyNAS Storage Appliance using the WebUI:



3. Using the email information, identify the drive that requires the replacement. Take the disk out, and replace it with a new disk where either of the following is true:
   - The new disk is an identical replacement
   - The new disk is larger than the disk it is replacing

4. Power on your MyNAS Storage Appliance

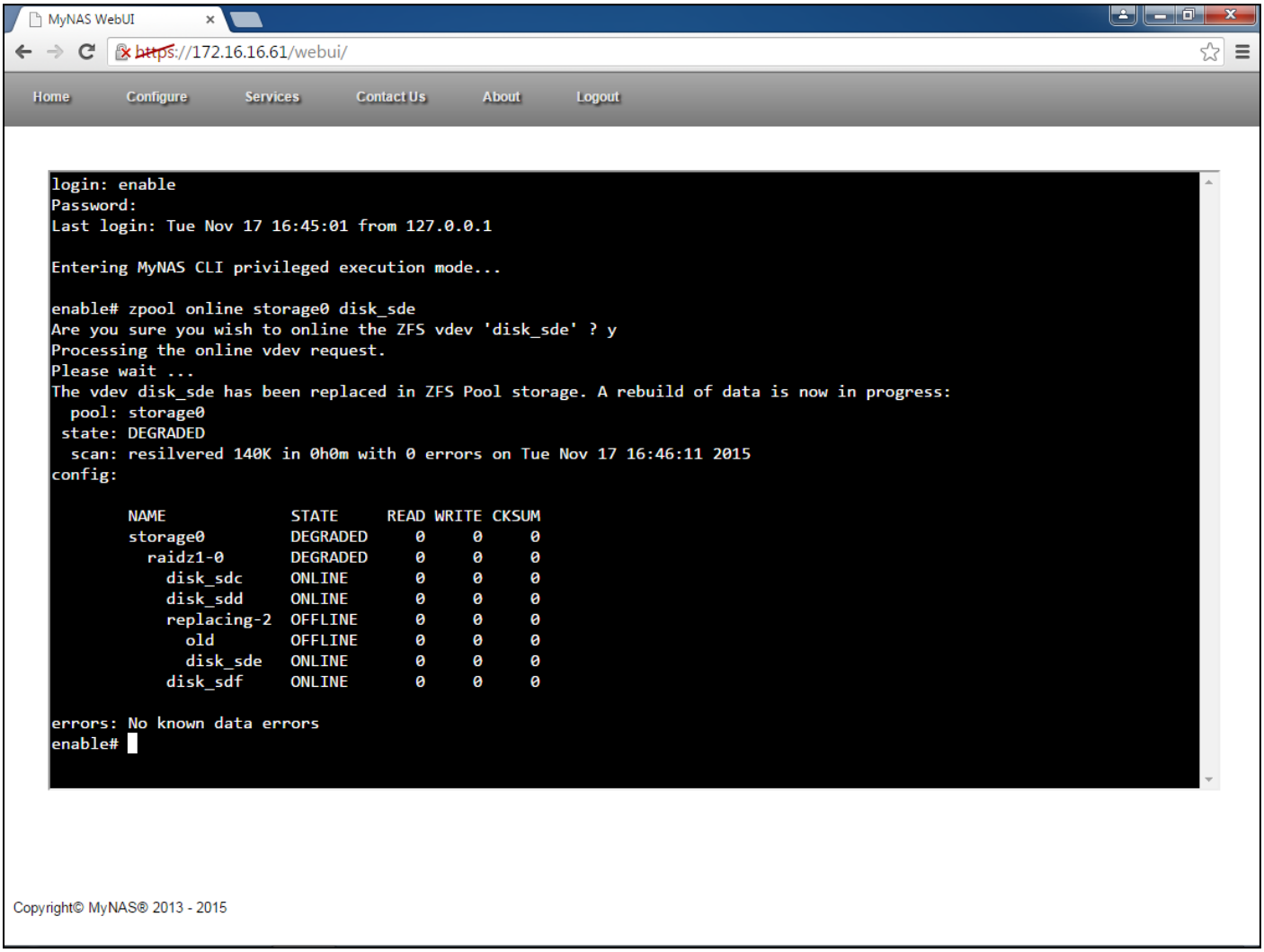
5. Log into the MyNAS CLI via the WebUI as the `enable` user and run the following command:

   ```
   zpool online <zfs_pool> <disk>
   ```

   where, zfs_pool equals `storage0` and disk equals `disk_sde` from the example above

   ```
   zpool online storage0 disk_sde
   ```

   This will set the replaced disk to 'online' within the ZFS pool.



6. The MyNAS storage appliance will now begin to 'resilver' the new drive bringing the ZFS storage pool back to a healthy state.
7. The rebuild time will depend on the quantity of data within the storage pool. To monitor the rebuild process, use the CLI command:

```
show zpool status
```

This will detail the progress of the rebuild

Appendix B - Replacing a disk in MyNAS Storage Appliance RAID Array

In the event that a system disk in MyNAS experiences a failure, use the following procedure to replace the disk in the system. For the example below, the following alert was generated by MyNAS:

```
This is an automatically generated mail message from mdadm
running on mynas. homenet.net

A Fail event had been detected on md device /dev/md1.

It could be related to component device /dev/sdb2.

Faithfully yours, etc.

P.S. The /proc/mdstat file currently contains the following:

Personalities : [raid1]
md1 : active raid1 sdb2[2](F) sda2[0]
      255936 blocks super 1.0 [2/1] [U_]

md2 : active raid1 sdb3[1] sda3[0]
      12317568 blocks super 1.1 [2/2] [UU]
      bitmap: 1/1 pages [4KB], 65536KB chunk

md0 : active raid1 sdb1[2] sda1[0]
      4192192 blocks super 1.1 [2/2] [UU]

unused devices: <none>
```

Use the following steps to replace a disk (in this case `sdb` in the example above) in the RAID array.

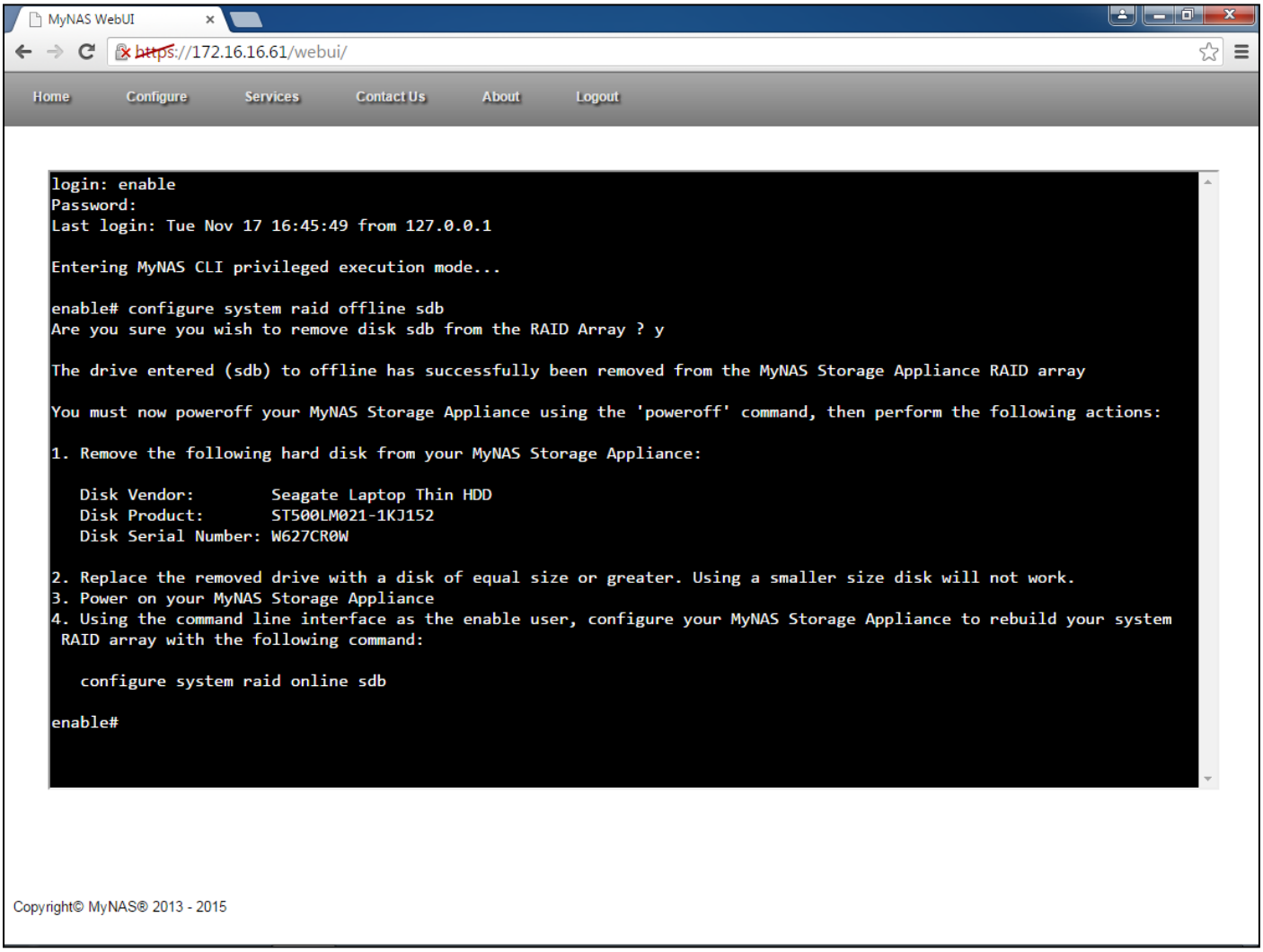
1. Log into the MyNAS CLI via the WebUI as the `enable` user via the WebUI and run the following command:

   ```
   configure system raid offline <disk>
   ```

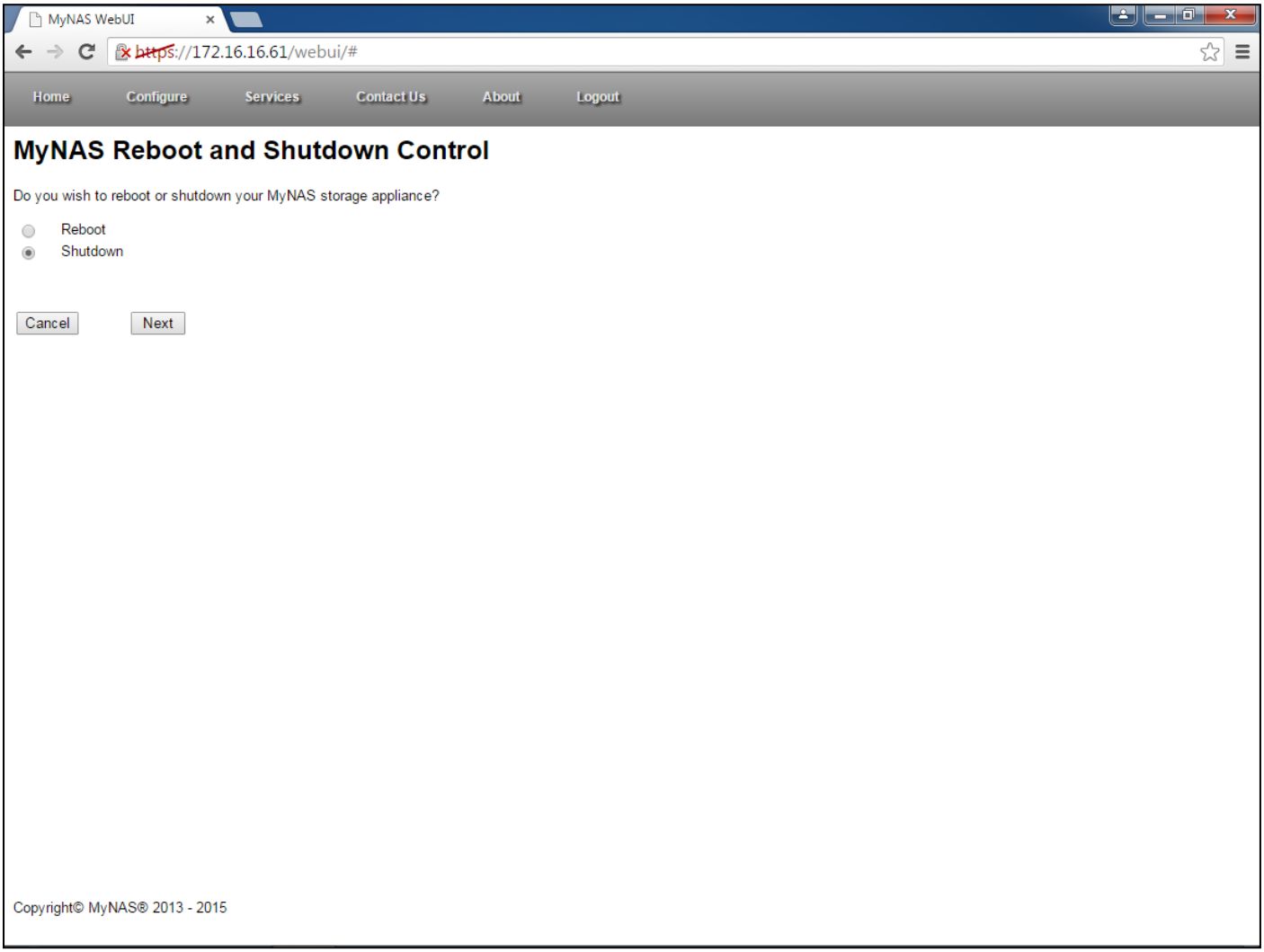
   where disk equals `sdb` from the example above

   ```
   configure system raid offline sdb
   ```

   This will set the bad disk to 'offline' within the MyNAS Storage Appliance and prepares the system for the disk replacement.



2. Power off your MyNAS Storage Appliance using the WebUI:



3. Using the email information, identify the drive that requires the replacement. Take the disk out, and replace it with a new disk where either of the following is true:
   - The new disk is an identical replacement
   - The new disk is larger than the disk it is replacing

4. Power on your MyNAS Storage Appliance

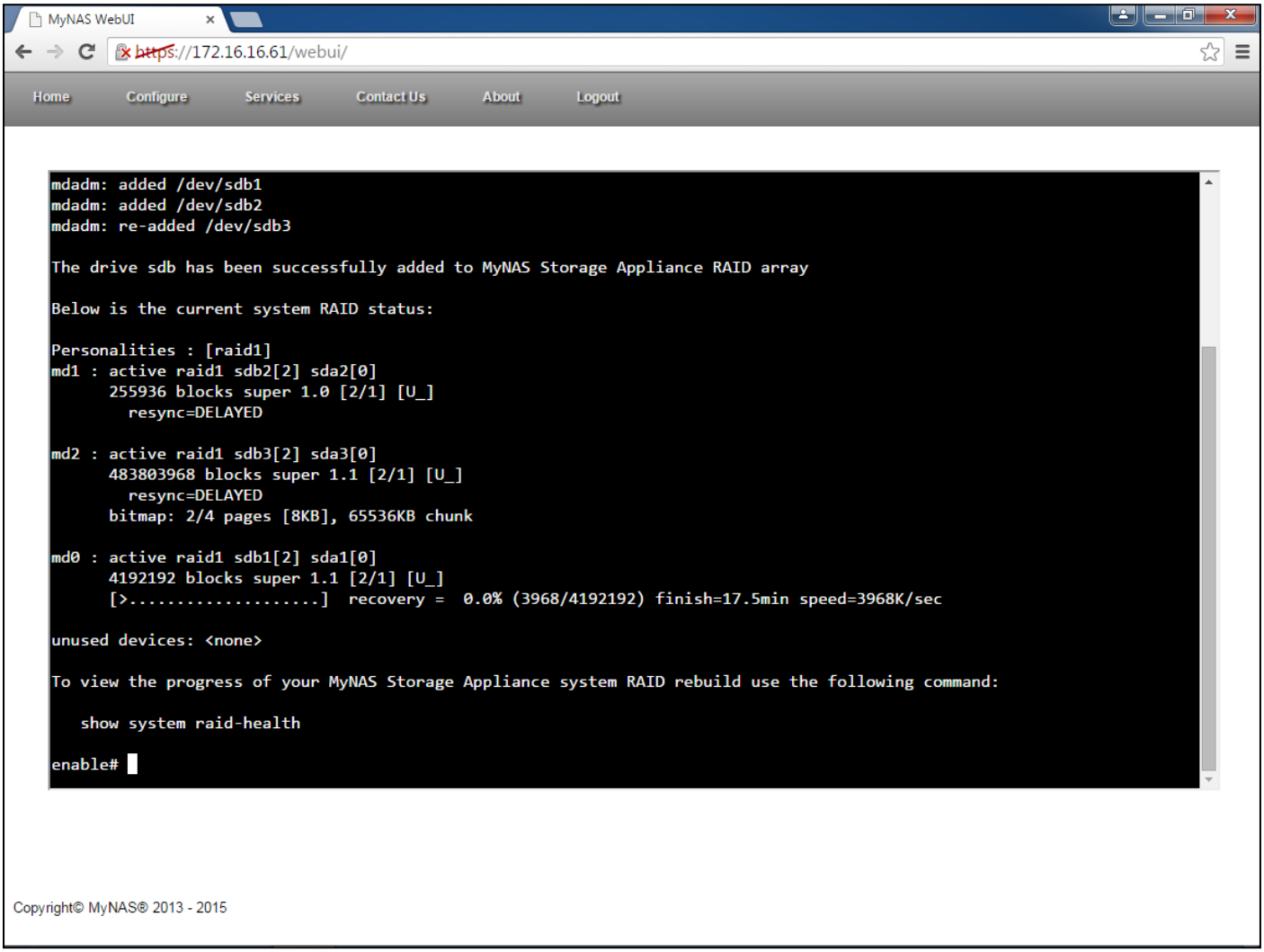
5. Log into the MyNAS CLI via the WebUI as the `enable` user and run the following command:

   ```
   configure system raid online <disk>
   ```

   where disk equals `sdb` from the example above

   ```
   configure system raid online sdb
   ```

   This will set the replaced disk to 'online' within the MyNAS Storage Appliance RAID array.



6. The MyNAS Storage Appliance will now begin to rebuild the new drive bringing the system RAID device back to a healthy state.
7. The rebuild time will depend on the quantity of data within the system RAID device. To monitor the rebuild process, use the CLI command:

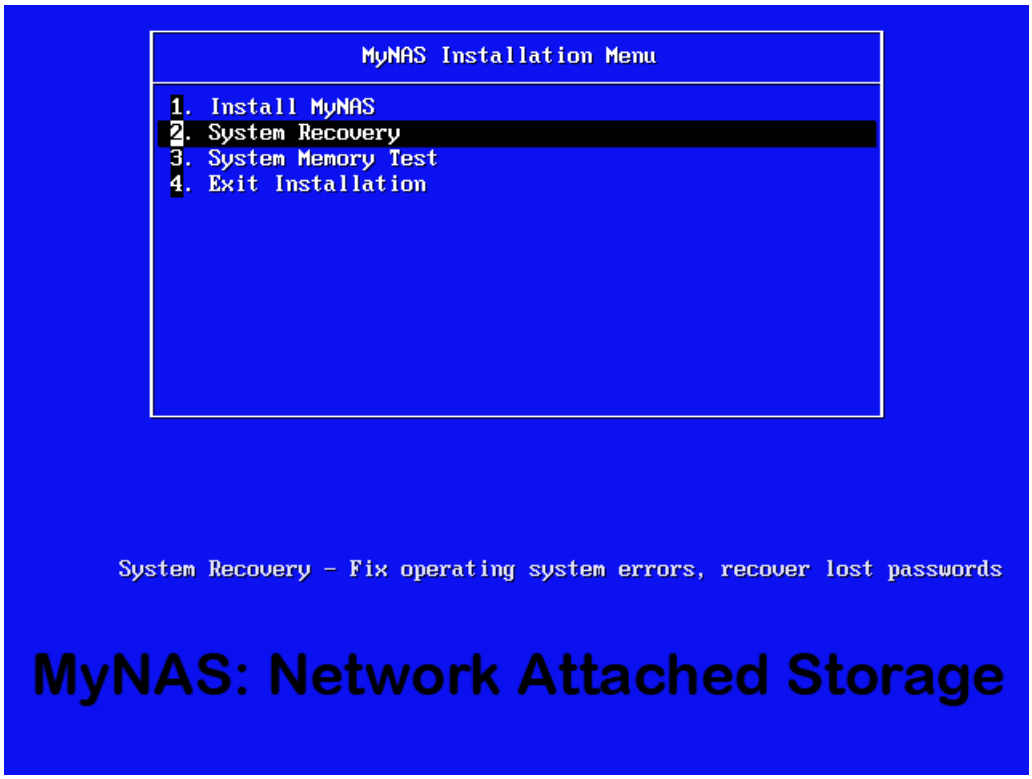
```
show system raid-health
```

This will detail the progress of the rebuild

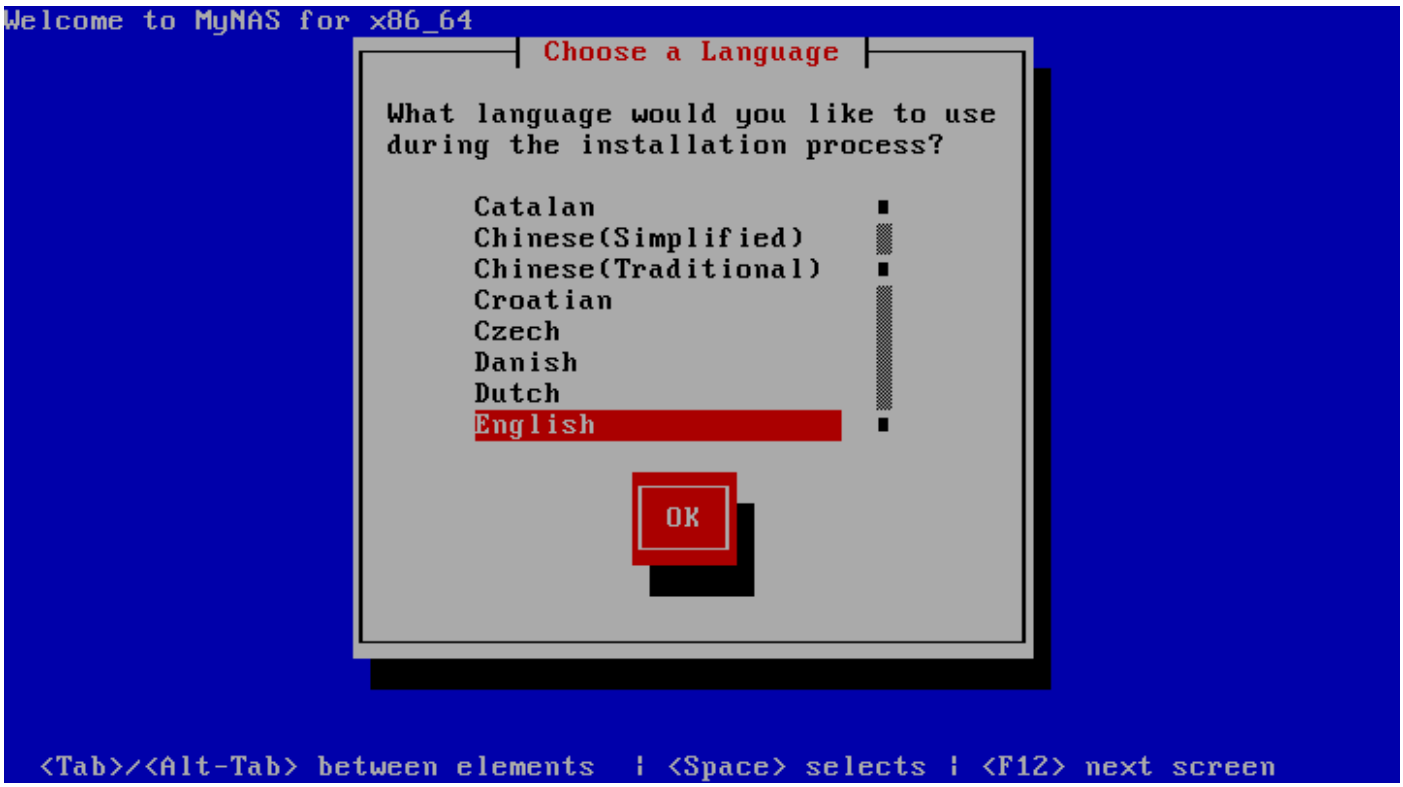
Appendix C - Performing a system recovery

In the event that MyNAS is experiencing an issue preventing the system from booting, it may be necessary to perform a system recovery to gain access to the system. If this does occur, follow the following procedure to gain access to the root file system to perform any required modifications.

To perform a system recovery, boot the MyNAS ISO as if you were to install the system. From the menu, select option 2 to perform the system recovery:



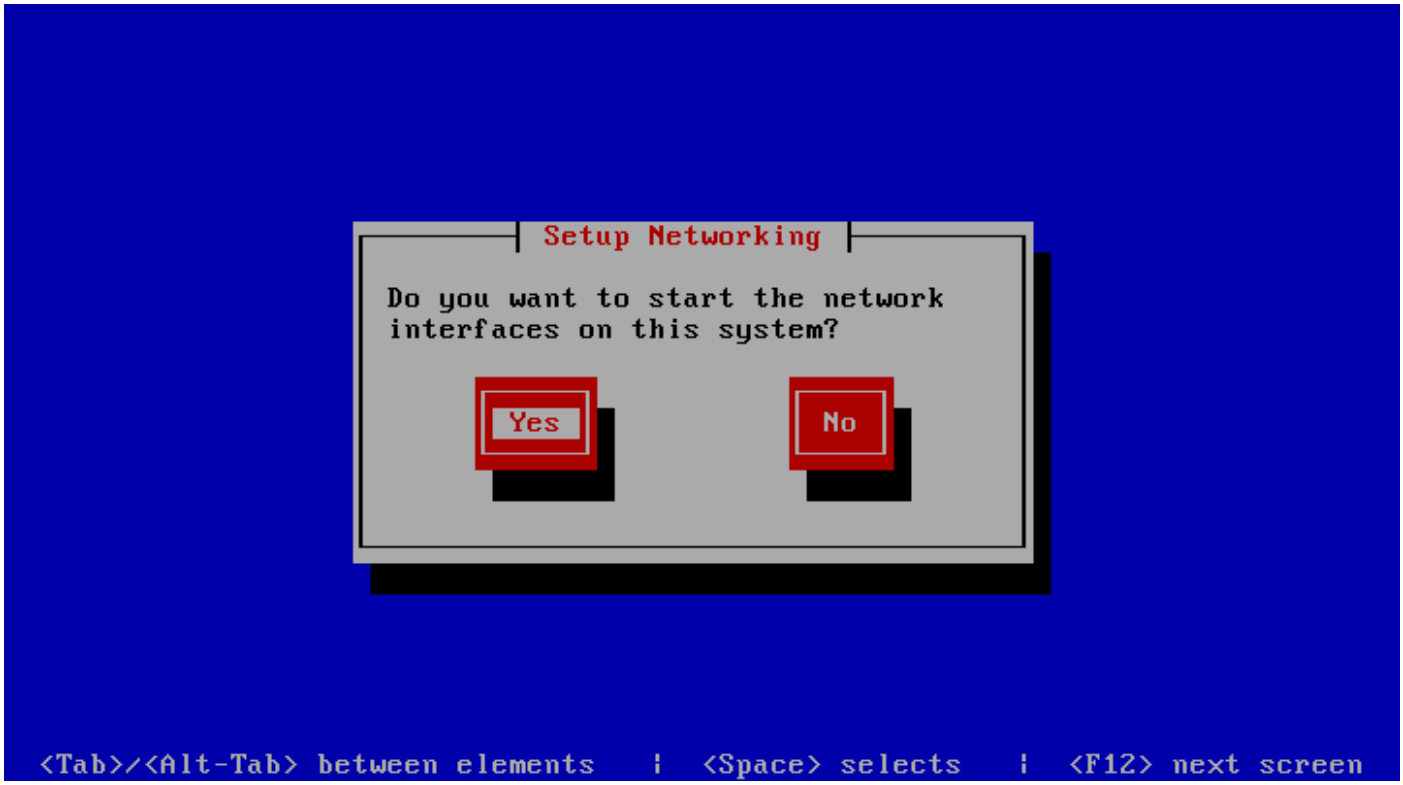
Once the recovery process has started to load a few items need to be configured.



Select the language for the recovery system. Press OK once selected

Select the keyboard type. Press OK once selected

Select the location for the rescue image. In this case it will be the Local CD/DVD as the location. Press OK once selected.

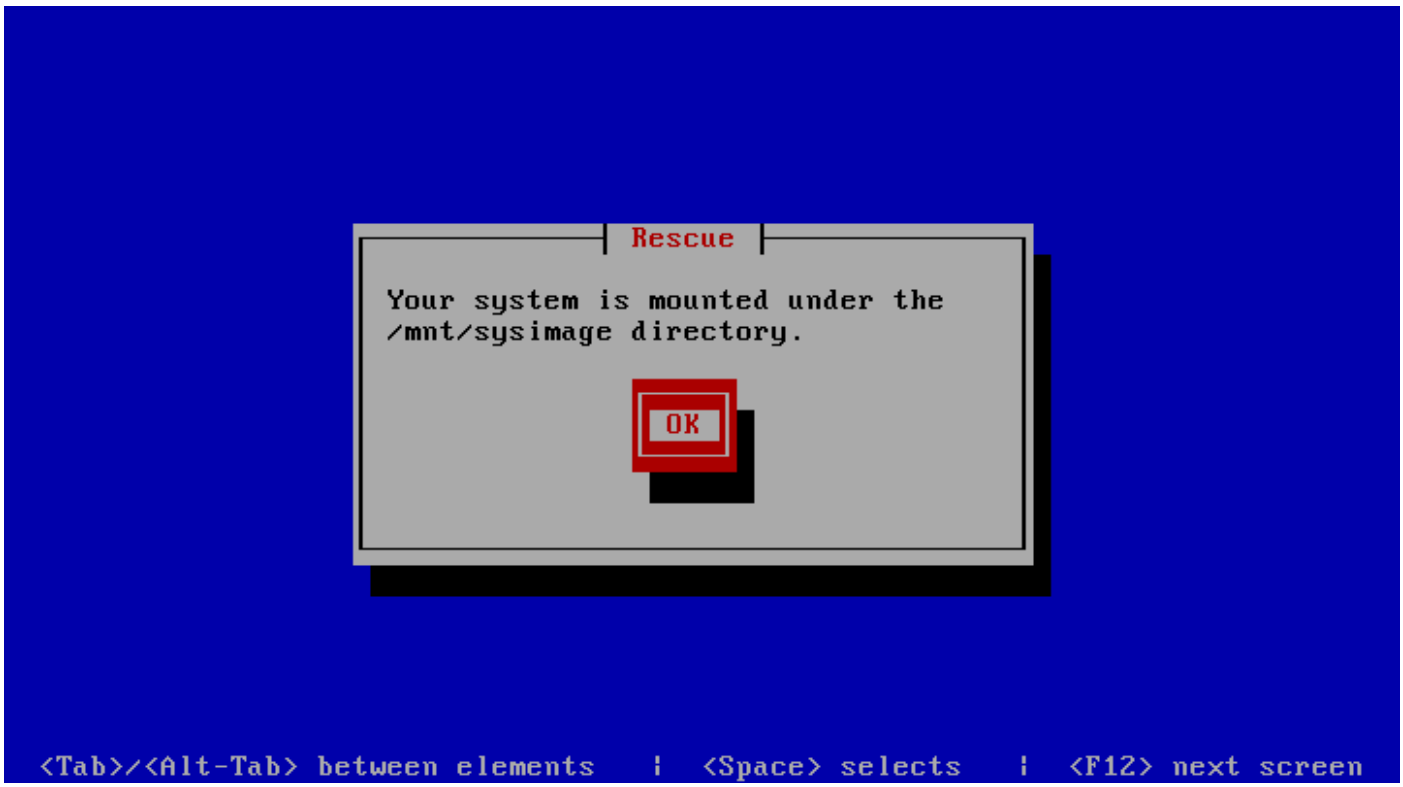


Depending on the type of recovery needed, you may want to start the network interfaces on the system. Follow the prompts to configure the network as required.

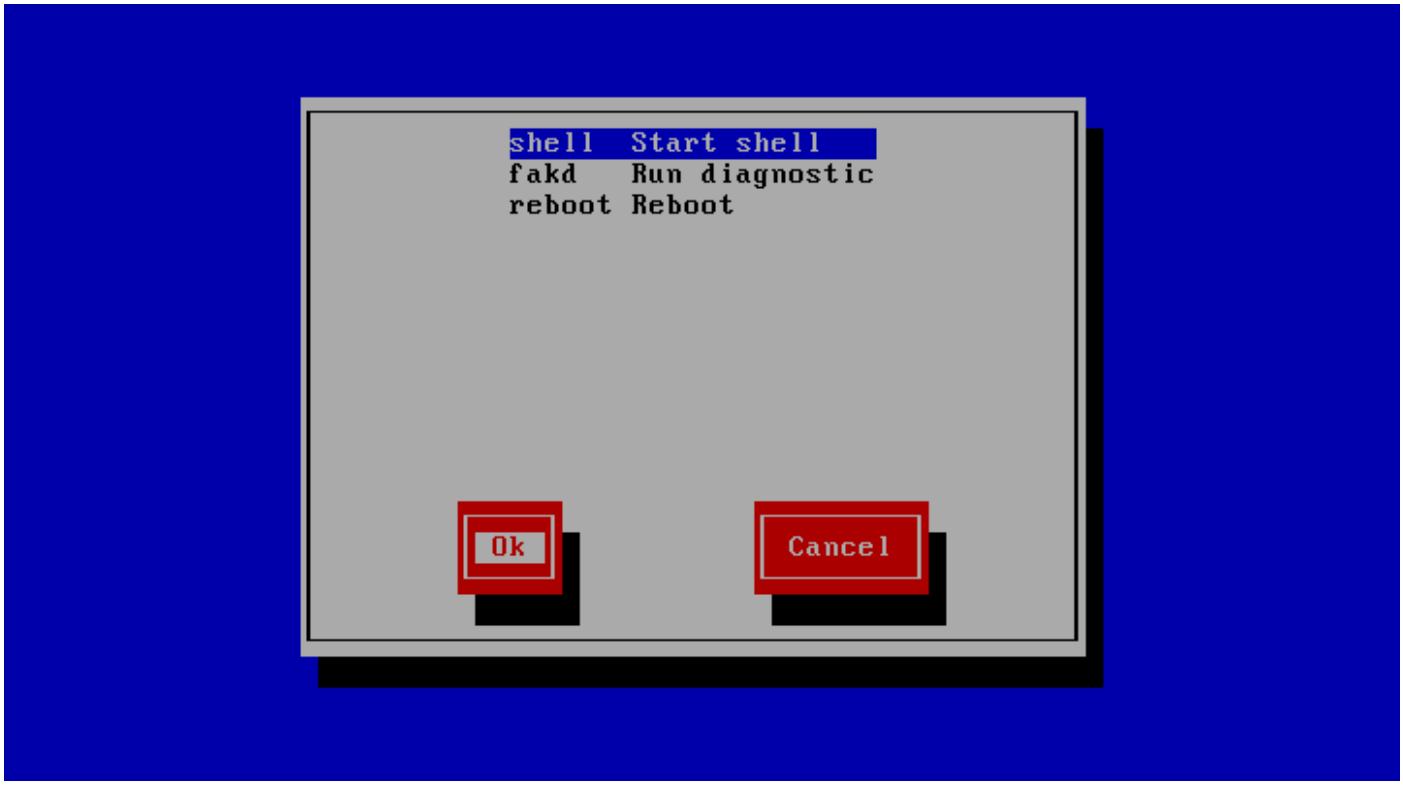
Tab through and click the Continue button

Once the system loads the rescue image the following will be displayed

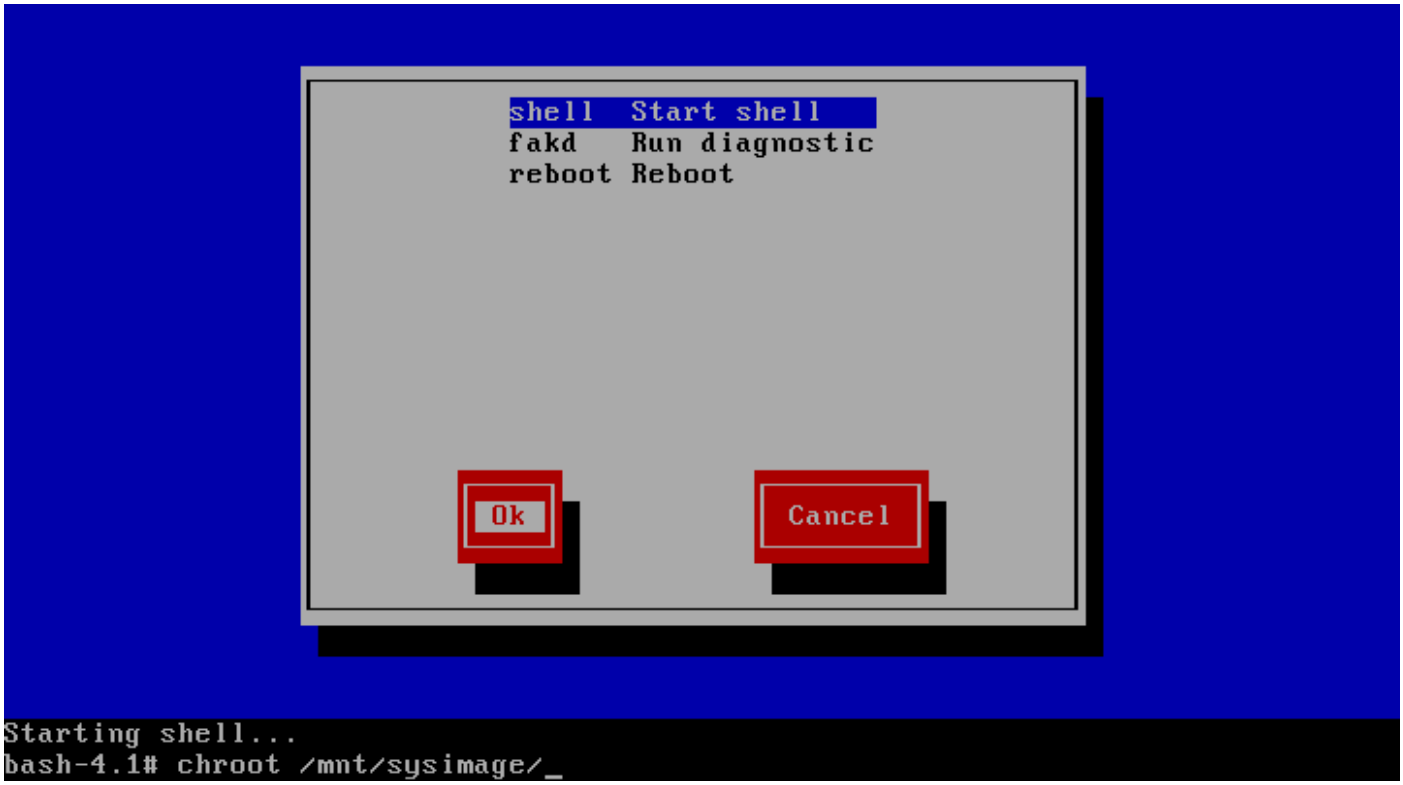
Click OK



Click OK again



Click OK again to start a shell on the system



Change to the sysimage root using the command chroot /mnt/sysimage

This will change the root to be your MyNAS installation. From here, the ZFS modules can be loaded or system operations can be undertaken to rescue your MyNAS installation

```
sh-4.1# modprobe zfs
sh-4.1# zpool list
NAME      SIZE  ALLOC   FREE    CAP  DEDUP  HEALTH  ALTROOT
storage      -      -      -      -      -  FAULTED  -
sh-4.1# zpool status
  pool: storage
 state: UNAVAIL
status: One or more devices could not be used because the label is missing
        or invalid.  There are insufficient replicas for the pool to continue
        functioning.
action: Destroy and re-create the pool from
        a backup source.
   see: http://zfsonlinux.org/msg/ZFS-8000-5E
  scan: none requested
config:

        NAME          STATE     READ WRITE CKSUM
        storage       UNAVAIL      0     0     0  insufficient replicas
          raidz1-0    UNAVAIL      0     0     0  insufficient replicas
            disk_sdc  UNAVAIL      0     0     0
            disk_sdd  UNAVAIL      0     0     0
            disk_sde  UNAVAIL      0     0     0
            disk_sdf  UNAVAIL      0     0     0
            disk_sdg  UNAVAIL      0     0     0
sh-4.1# _
```

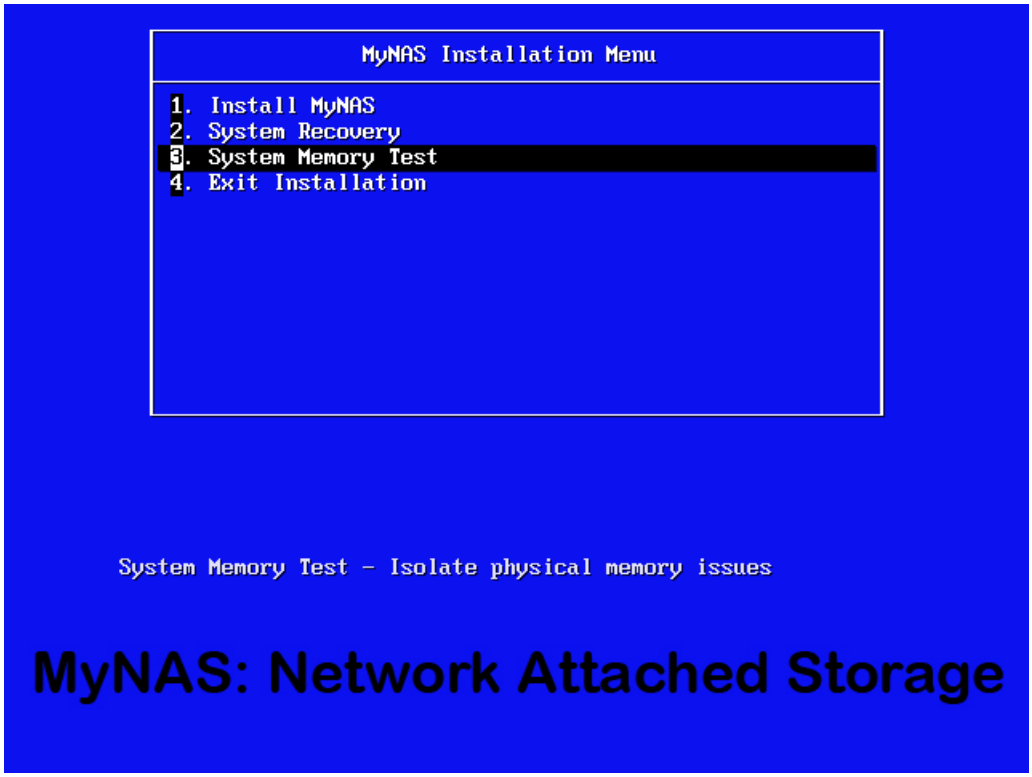
Once any rescue operations are complete, type exit twice. This will take you back to the rescue image configuration.

Select reboot and click OK to restart your system.

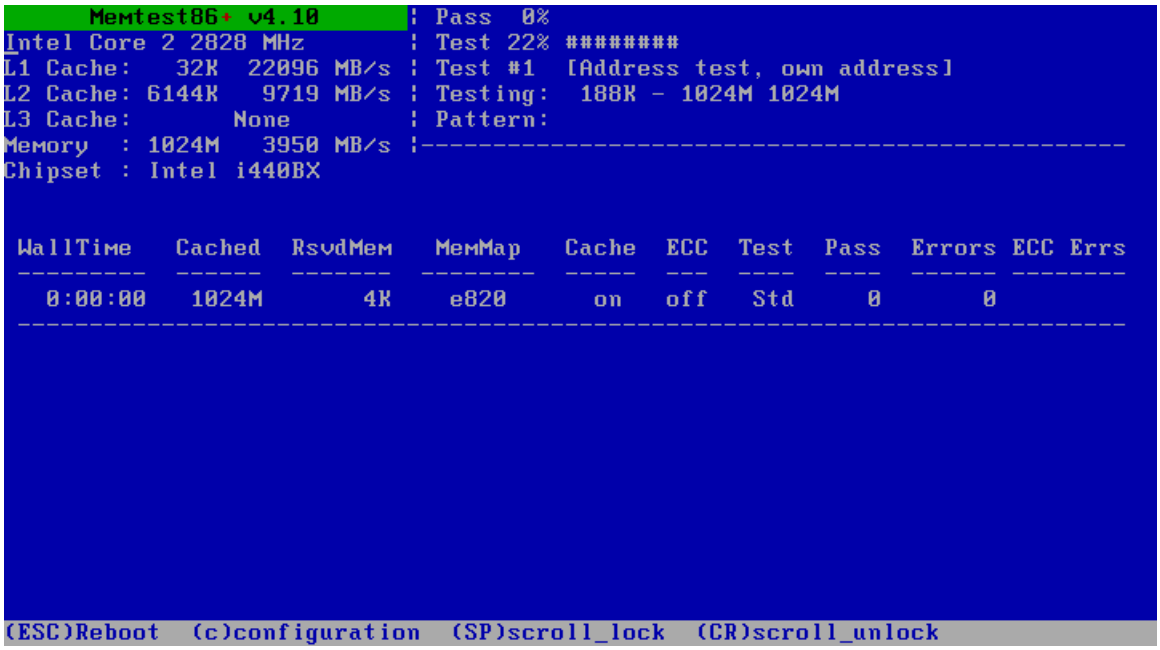
Appendix D - Performing a system memory test

The MyNAS ISO provides the capability to perform a system memory test to help identify if your system has any memory issues. To perform this test, boot the MyNAS ISO as if you were to install the system.

From the menu, select option 3 to perform the memory test



This will run MemTest86 against your memory on your system



Should there be any issues with the memory, MemTest86 will highlight these against the various tests. it is advisable to run the tests at least twice if testing memory.

Appendix E - Known Issues

The list below details known issues for MyNAS:

Issue ID	Issue Description	Resolution
Issue #0001	When installing or booting MyNAS, the following message is briefly displayed: `Problem loading in-kernel X.509 certificate`	This message indicates that the date and time of your system is not properly configured. To resolve this issue: 1. Reboot the system and configure the correct date and time for your location in the system BIOS 2. Install MyNAS 3. Configure the correct timezone, date and time for your location inside MyNAS
Issue #0002	When installing or booting MyNAS, the following message is briefly displayed: `Failed to access perfctr msr (MSR c1 is 0)`	This message is advising that the CPU on which you are currently installing does not support performance counters. It is safe to ignore this message. **Note:** This message is also typically displayed when running MyNAS within a virtual environment such as VMware.